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# USSR Report

NATIONAL ECONOMY

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NATIONAL ECONOMY

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## AGRO-ECONOMICS, POLICY, ORGANIZATION

### NEW SELSKAYA ZHIZN SUPPLEMENT APPEARS

Moscow SELSKAYA ZHIZN in Russian 4 Jan 87 p 2

[Unattributed report: "Meet 'VESTNIK AGROPROMA'"]

[Text] Today the first issue of VESTNIK AGROPROMA [AGROPROM HERALD], a weekly supplement of the newspaper SELSKAYA ZHIZN, was issued to subscribers and Soyuzpechat kiosks. It is thought that this periodical will spark readers' interest by bringing to light everything new and foremost in the country's agroindustrial complex.

The issue opens with a statement to readers explaining tasks facing the new publication and ways to resolve them proposed by the editorial collective. The main theme of the weekly's first issue is the problem of broadening the implementation of interfarm cost accounting in kolkhozes, sovkhozes and in all agroindustrial enterprises and organizations. It is no accident that chief attention is devoted to this subject. The chairman of the Kuban Rodina Kolkhoz, Hero of Socialist Labor P. Shtanko, points out in his article, "Wages According to Income," that cost accounting indeed links state, collective and individual interests best and stimulates an economical attitude on the part of each worker toward work and the public good.

M. Vasilyev, director of Novosibirsk Oblast's Morskiy Kolkhoz, and his colleague I. Litvinov, director of the Stepnyy Sovkhoz of Kalmyk ASSR and Hero of Socialist Labor, share their experience in the skillful use of the collective contract and check control system over production expenditures.

Pages of the weekly devote significant attention to articles and reports dealing with questions of quality improvement in production for state procurement and the introduction of innovations in science and equipment and modern technology.

Rural residents can also get much useful information with regard to various problems of private plot maintenance.

/6091

CSO: 1824/125

## AGRO-ECONOMICS, POLICY, ORGANIZATION

### FAMILY CONTRACT BOOSTS LABOR PRODUCTIVITY

Moscow SELSKAYA ZHIZN in Russian 20 Dec 86 p 2

[Article by Yu. Savin, SELSKAYA ZHIZN special correspondent, under "Economic Review" rubric: "'Family Contract"; first three paragraphs are source introduction]

[Text] In the decree "On Urgent Measures to Increase Labor Productivity in Agriculture on the Basis of the Introduction of Rational Forms of Its Organization and Cost Accounting," the CPSU Central Committee noted the necessity of doing everything possible to develop the family contract. What is the nature of this progressive form of management that is becoming more and more widespread in all regions of the country?

The family contract represents one of the forms of the collective contract. People work on public land and utilize public means of production. The agreement between the farm and the family provides for the planning principle. It also preserves public control of production, which is carried on under full cost accounting. There are also such requirements of the collective contract as voluntary participation in the formation of subdivisions, the remuneration of labor in accordance with final results, material responsibility for resources and output, extensive independence, and democratic principles of management.

The main feature of the family contract is that relatives make up the brigades and links performing the jobs. The family becomes an independent production cell of the farm. Controls are put into effect that generally provide for a substantial increase in labor productivity.

It was pleasing to hear in Nekrasovskiy Rayon of Yaroslavl Oblast about the favorable changes in the dairy section located in the remote village of Pentelevo. Here the Uvarov family is in charge. The three of them take care of about 90 cows at Kolhoz imeni Maksim Gorkiy under contract principles. They themselves are the milkmaids, fitters, livestock handlers, accountant and brigade leader. Each is responsible for about 30 cows. By way of comparison, for example, the load per worker is less at other highly mechanized complexes. Meanwhile, the equipment at Pentelevo is nothing out of the ordinary and they use baskets to distribute the feed. Labor productivity at the section, which

they almost wanted to eliminate, is twice the average for the farm and the production cost per quintal of milk is lower by 10 rubles.

What helped to achieve these results?

#### EFFICIENT LABOR

The family contract made the well-being of the family and its income a direct function of what is also the goal of public production--the increase in output, the improvement of its quality, and the lowering of production cost. The members of such a collective are susceptible to contemporary work methods and are striving to put new ideas into practice more quickly.

In the family, there is no need to control the amount of labor of each person and reciprocal accounts are simplified. It is more expedient to combine public production with housekeeping and the care of children. It is easier to resolve questions of replacing workers during days off, vacations or illness. It becomes possible to reduce the administrative expenditures of the farms.

One should also take into account the educational importance of the contract. Under the contract, the family has an objective sense of its responsibility for the section of public production entrusted to it by the collective. The feeling of being in control causes one to have an attentive attitude toward the land, machinery and other resources. Along with the adults, the children soon get used to labor and take an active part in the affairs of the kolkhoz or sovkhoz.

The necessity of the extensive development of the family contract was also noted at the 27th CPSU Congress. The ability to control this economic lever for influencing the efficiency of production is an important quality for the contemporary manager.

Considerable experience has been gained in the country. Begin with the fact that the family contract is widespread in sheep raising, especially on the pastures, in Kazakhstan, Kirghiz and Turkmenistan. Primarily women and children are involved in the home raising of mulberry silkworms in Central Asia. Hops growers in the Chuvash SSR and tobacco growers in Armenia are working in families.

As we can see, it is a matter of sectors that have been less affected by industrialization than others. There is still a lot of manual labor done here. And the family is capable of satisfying this requirement through the efforts of its own basic workers as well as the personal contribution of pensioners and youths. Each can find a job to suit his age, state of health, habits, desires and other individual characteristics.

By the way, it is not only and not so much on account of additional labor time that they are using family collectives. The main secret of their success is quality and the timeliness of the performance of the work.

Characteristic in this connection is the experience of the farmers of the Tatarskaya ASSR. For a long time, mangel-wurzel did not do well in the



republic. They were not able to transfer the care of the fields and the harvesting of the roots to machine operators. The visits of chiefs did not produce the necessary results. And then they began to assign the crops to families on a contractual basis, a half hectare or more as desired. They set a monetary payment per quintal of harvested roots and paid out part of the harvest in kind. And the harvest of galactagogue fodder crops per hectare more than doubled.

This "by-the-hectare approach" was applied in sheep raising, beet growing, viticulture and horticulture. It is also used successfully to attract urban dwellers to rural labor. At the Moldavian Nistry Sovkhoz, for example, in addition to its own workers, several hundred inhabitants of the nearby town of Bendery entered into contracts with the administration to grow vegetables. A family is assigned a half hectare of onions or as much as 1 hectare of cucurbits or tomatoes. They are paid according to job prices per hectare of vegetables.

People are frequently attracted by the circumstance of the by-the-hectare approach that part of the harvest is sold to them at a favorable price. It should be noted that the existing economic mechanism permits a broader application of in-kind incentives. But it is important to study carefully the conditions of the contract between the family and administration and to observe them strictly. This must be said, for there are still frequent cases where the duties are violated.

The family contract also proved to be positive in animal husbandry. In the country in 1985, the public signed more than 1.2 million contracts for the fattening of livestock belonging to kolkhozes and sovkhoses. The animals turned over to family sections are usually allocated feed according to standards one-third below what the livestock requires on public sections. The sufficiency of the ration is ensured through the good management of fodder and by using the wastes of the household and private plot.

The form of the family contract to be adopted is decided locally. Thus, the Ushgulskiy and Iparskiy sovkhoses of the mountainous Mestiyskiy Rayon of the Georgian SSR experienced a shortage of personnel, feed and premises. Under contracts, the public livestock was turned over to the people under contract conditions (an average of three or four head per family). The people also accepted the duties of procuring fodder and caring for the agricultural land assigned to them. Labor is remunerated in accordance with output. Family income increased significantly but the sovkhoses also sharply increased sales of meat and milk and nonprofitable farms became profitable.

At the Lyaudes Draugiste Kolkhoz in Shvenchenskiy Rayon of the Lithuanian SSR, they utilized the family contract in the restoration of the previously eliminated swine breeding section. Four kolkhoz farmsteads answered the administration's request that they fatten piglets on their private plots. They were allocated land for growing root crops and greens, mixed feed, granulated grass meal, and whole milk substitutes. Having fattened the animals, the people received a solid increase in their family budget. And the kolkhoz earned an additional 10,000 rubles in net income. In the rayon as a whole,

there are already more than 50 families fattening pigs under the method of the family contract.

#### ON FRIENDLY TERMS WITH TECHNOLOGY

One might get the impression that the family contract is applied only where there are white spaces in the mechanization of production. By no means.

Scientific-technical progress is developing in such a way that frequently the use of a complex of machines ensures good final results in small collectives. In nonmechanized work, for example, one worker could cultivate an average of less than 10 hectares but under contemporary technology, even under nonchernozem conditions, the load is as much as 100 hectares per machine operator. So that whereas before a large kolkhoz brigade worked on 300 hectares, now 3 or 4 people can handle that much. In exactly the same way, previously a brigade was needed to care for 50 cows and now 2 or 3 workers are enough. Why can such a link not be made up of the members of one family or two or three harmonious families?

And some administrators take advantage of this possibility. It was interesting to learn of the work in Siberia of the so-called KIT's--collectives of intensive labor--that achieve truly herculean results with few workers.

At the Kochkovskoye Experimental and Demonstration Farm in Novosibirsk Oblast, the three Konoplyannikov brothers cultivate 1,200 hectares of land. The grow grain and fodder crops. They do everything, from the preparation of the soil to the harvesting, through their own efforts. The technology is intensive and the methods of labor as well as the chemicals and varieties used are the most up-to-date. Each link member produces five to six times as much output as in neighboring collectives.

Where do these results come from? Perhaps they brought some well-known aces into the link? No, although masters of their own trade are certainly at work here. The main thing is that they are people who want very much to work and make a living and who have the possibility of achieving what they want. Specialists and machine operators worked out the conditions for the remuneration of labor and helped to select the structure of the crops and the set of equipment and taught how to make better use of fertilizers, herbicides and toxic chemicals. The machine operators themselves strictly observed the requirements of agricultural technology and this is the reason for the good harvest. They took advantage of every minute of working time, rapidly shifted from one job to another, and contrived a combined machine unit capable of preparing the soil for planting, fertilizing it, sowing and packing. This is why the three of them performed the amount of work in one shift that required eight of their neighbors to do and this is the source of the good final results.

They are characteristic of the family contract in other sectors as well. For example, the link of S. Kholbayev (father and six of his sons and their wives) at Sovkhoz imeni U. Yusupov in Kashkadarya Oblast grew cotton on 90 hectares and received 45 quintals of raw cotton per hectare. Machines brought in 90

percent of the harvest. It is natural that the link's labor productivity was several times higher and the production cost considerably lower than in neighboring collectives. At Ust-Ordynskiy Sovkhoz in Irkutsk Oblast, V.S. Onopriyenko and his sons grew perennial grasses and obtained 60 to 66 quintals of hay per hectare under the conditions of Siberian dry-land farming. At Krasnyy Partizan Kolkhoz in Novouzenskiy Rayon of Saratov Oblast, a link of related machine operators grew corn.

Earnings in family collectives are usually high. And this sometimes serves as a reason to accuse people of chasing after the "long ruble." A fundamentally incorrect viewpoint! If a person works according to his capabilities and gives the country much output, then it is fair that his income corresponds to his contribution to public production.

Family collectives are also working on public sections. At Kolkhoz imeni Panfilov in Uspenskiy Rayon of Pavlodar Oblast, the A.Ya. Rudko family fattened about 2,000 head of cattle during the 11th Five-Year Plan, obtaining an average daily weight gain of more than 1 kilogram. The family collective of the Idrisovs from Karamalinskiy Sovkhoz in the Tatarskaya ASSR fattened pigs, obtaining an average daily weight gain of about 600 grams from each animal. At Kolkhoz imeni Kalinin in Ostrovskiy Rayon of Pskov Oblast, the husband and wife team of the Pavlovs took care of a section for heifers.

Specialists are very interested in cases of the utilization of the small-group contract in dairy cattle breeding. The example of the Yaroslavl Kolkhoz imeni Maksim Gorkiy is not unique. A small section for 22 cows is in operation at Luunya Sovkhoz of Vebri Farm in Estonia. Here there is a scraper conveyor for the removal of manure, automatic watering of stock, a milk line, and a milk cooler. A tractor has been assigned to the section for the delivery of feed and the removal of manure. All work, including the care of the nearby enclosed cultivated pasture, is performed by a family, one of whose members is a machine operator. Housing is located nearby. A time study carried out by specialists showed that each worker is busy about 4 hours a day in the summer and that the load increases in the winter but on an annual average does not exceed the level established by legislation. The productivity of cows in terms of base fat is as much as 6,000 kilograms per year and the production cost of a quintal of output is 6 rubles lower than the sovkhov average. There are similar examples in Latvia as well as in Moscow, Vologda, Kirov and other oblasts.

#### NO FORMALISM TOLERATED

Nevertheless, the family contract has still not found its rightful place in the practice of sovkhov and kolkhoz production. They are now most often resorting to it out of need (there are not enough personnel, people do not go for poorly paid manual labor, there are no premises for keeping a large number of cattle under one roof, it is a pity about the "idle" premises and land of the abandoned farms, and so on). There are still not many who are convinced by the example of the enthusiasts who have shown that the family contract is not a heritage from the old but one of the contemporary methods of management.



Formalism and irresponsibility are frequent in the introduction of the family contract. Some managers do not bother to make a careful study of contractual obligations or to organize the guaranteed provision of resources to links. Frequently family collectives have to fend for themselves. Specialists are in no hurry to give them competent advice or to teach them progressive work methods.

Unfortunately, there are frequent instances where family contract collectives fall apart. One of the reasons for facts of this nature is the inadequate legal protection of this form of management. The lack of a standard position on the family contract, a standard contract or recommendations for the organization of the work of such collectives is telling.

So it happens that almost every day such a collective is prescribed a regimen of work and rest. People are distracted for the performance of duties not foreseen by the reciprocal obligations of the family and farm. Bureaucracy and the violation of democratic principles of management undermine the confidence of people in their own rights and reduce their responsibility for final results.

But is the manager's lack of understanding the only cause of such facts? Here he must share the blame with economic science. It would seem that the establishment of any labor collective must rely on a system of standards indicating the need for manpower during particular periods, under some technology or other, and under some organization of labor or other. But practice in the establishment of those same Siberian KIT's showed that there is no such standardized base.

No system has yet been worked out for economic incentives in the collective contract, including the family contract. Now many of those working under contract strive, let us say, to obtain as much fodder from the public farm without especially troubling themselves with the search for their own inexpensive sources of fodder. This is the thrust of wage rates linked only to the quantity of produced output. And why not at the family level make use of the proven system of incentives from gross income and the standard production cost of output? Such instances are still isolated.

And still another aspect. It is difficult to count on the broad dissemination of the family contract if standard working and living conditions are not established. No mechanism has been worked out for the material responsibility of the administration for the violation of obligations in the material and technical provision of contract collectives. The transfer of a small remote section to a family does not mean that there is no need to be concerned about the possible mechanization of labor and the improvement of pastures. People work well if they know that the sovkhoz board of directors or kolkhoz management will not forget about the transporting of children to school and their provision with necessary goods.

In short, the family contract, just as other economic methods of management as well, gives additional responsibilities to managers, specialists and public organizations. But these cares increase the number of people actively striving to raise the efficiency of public production. The main thing is to improve the final results of management and to make a greater contribution to the realization of the Food Program.

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## LIVESTOCK AND FEED PROCUREMENT

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### PARTY OFFICIAL ON LIVESTOCK, FEED PRODUCTION TASKS

Moscow ZHIVOTNOVODSTVO in Russian No 11, Nov 86 pp 2-7

[Article by V. K. Onisovets, deputy head of the Division of Agriculture and the Food Industry of the CPSU Central Committee: "To Carry Out Livestock Wintering in an Organized Manner"]

[Text] The calendar marks off the first winter days. Livestock sections have additional concerns--livestock wintering has begun on most of the country's territory. The rates of increase in the production of livestock products and the fulfillment of the assignments of the first and second years of the 12th Five-Year Plan will depend on efficient work organization during the winter period.

As is well known, as a result of the extensive organizational and political work of party organizations, agroprom bodies, and farm managers and specialists and of the stepped-up labor of all workers in agriculture and in other sectors of the agro-industrial complex, positive shifts in the development of animal husbandry have been attained recently. Plans for the production and procurement of meat, milk, and other products are also fulfilled successfully during the current year. During 9 months of 1986 state resources received 7.6 percent more livestock and poultry, 5.4 percent more milk, and 5.6 percent more eggs than during the same period of last year. The productivity of the milch herd rose, weight gains in raised and fattened animals increased, and the egg production of poultry grew. At the same time, an increase in output was obtained without a rise in the stock population--through intensive factors. Many farms in the Ukraine, Belorussia, Lithuania, Moldavia, Krasnodar and Stavropol krais, and Leningrad, Moscow, Belgorod, Lipetsk, Tomsk, and a number of other oblasts increased the production of livestock products at high rates. Complex tasks will also have to be accomplished in the future.

To ensure an efficient utilization of the increased capabilities of livestock sections and greater effectiveness of the labor of animal husbandry workers is a paramount concern. These capabilities are considerable. On kolkhozes and sovkhoses more coarse and succulent feed has been procured than last year, its quality has improved, the fodder storage and processing base has been strengthened, the level of overall mechanization of labor intensive processes at livestock sections has risen, and new production premises and cultural and

every-day projects are being commissioned. It is very important to fully utilize this potential and, as stressed at the June (1986) Plenum of the CPSU Central Committee, on this basis to ensure a further rise in the rates of production growth. This is a practical matter, but it requires an improvement in production and technological discipline and the application of economic levers of management and advanced forms of labor organization and stimulation, primarily cost accounting and the collective contract. Unfortunately, these levers and incentives have not at all been activated on all farms and do not operate at full force, which hampers the course of further changes toward better quantitative and, especially, qualitative indicators of the sector's development.

In a number of oblasts and republics collectives of livestock breeders have not yet been able to overcome the previously tolerated lag, continue to be satisfied with low milk yields and weight gains in feeder livestock, manage the production of products at livestock sections with high expenditures of feed and funds, unprofitably, and often even at a loss. Here there is a need for an intervention and active help on the part of specialists at the agroprom and at zonal scientific institutions in order to determine, under the specific conditions of a farm and a livestock section, effective methods of eliminating shortcomings and ways of attaining a stable growth of the production of meat, milk, and other products.

Under winter conditions problems of efficient feed utilization acquire paramount importance. It is gratifying to note that extensive work on increasing the production of coarse, succulent, and other feed for animal husbandry has been done through the efforts of farmers and machine operators this year. Under complex weather conditions quite a good harvest of perennial and annual grass, corn for silage, and fodder root crops has been grown virtually everywhere. The harvesting of grass for hay and haylage has been carried out in a more organized manner than during previous years and grass has a higher grade. During wintering many farms placed 2,000 to 2,500 feed units of coarse and succulent feed per standard cow in storage facilities and are doing their utmost to additionally increase these reserves and to provide every livestock section with feed to the full extent of its need. Kolkhozes and sovkhoses in most oblasts in the RSFSR, Lithuania, Kazakhstan, Georgia, Armenia, Kirghizia, and the country's other regions have exceeded the accumulation of coarse and succulent feed considerably as compared to last year's level.

A general increase in the attention of party organizations and economic managers and specialists to the growth of the production of good hay is a characteristic feature in feed production this year. In Kazakhstan hay procurements increased by 1.5 million tons. The Baltic republics fulfilled the annual plan for the accumulation of hay as early as July and created its reliable insurance reserves on all farms. With due regard for the harvesting of perennial grass of second and subsequent cuttings on irrigated land, annual feed mixtures, and aftergrass from natural meadows many farms will have 2 or 3 tons of hay per cow and approximately the same quantity of haylage.

At the same time, on most farms in the Ukraine, Uzbekistan, and Moldavia hay and haylage procurement volumes by no means fully meet the needs of animal

husbandry. Byproducts of grain production--straw, chaff, and corn cobs and stems--account for a significant share in the coarse feed balance. All this feed should also be utilized with maximum efficiency for increasing the production of livestock products. However, we must not fail to take into account that the more coarse feed, which is not very nourishing, is contained in rations, the more grain and crude protein are needed for balancing its nutritive value.

In our country and abroad there are numerous scientific data indicating that average daily milk yields of 10 to 12 kg and weight gains of 500 to 600 grams in cattle can be obtained virtually without an addition of concentrated feed if high-quality coarse, succulent, and pasture feed is utilized. At the same time, with the structure of the feed balance formed on many farms, to obtain such productivity, up to one-third of mixed feed and more must be included in rations. Therefore, a decisive turn to an increase in the production of high-quality hay, haylage, and other coarse and succulent feed is the command of the time and an urgent economic need for every farm with developed animal husbandry.

In recent years kolkhozes and sovkhoses have procured more than 250 million tons of silage for winter. Problems concerning the raw material base, optimum time for silage crop harvesting, degree of feed mincing, and methods of placing, ramming, and insulating it from the effect of atmospheric oxygen and of applying various silage leavens and preservatives have been worked out in experiments by scientific institutions and in the practice of advanced farms. All these advanced methods have found an extensive application in the practice of many farms. However, there are still many cases during which, when corn and cereal grass are silaged, basic conditions for obtaining high-quality silage with the necessary content of the dry substance are not maintained, which lowers the nutritiousness of feed and the ratio of its conversion to livestock section products. The attention of local agroprom bodies was drawn to this circumstance. Unfortunately, however, nor was the implementation of all agrotechnical methods of silage corn cultivation according to grain technology ensured in a number of places this year. Even on areas, where early- and medium-ripening corn hybrids were sown, many farms in the nonchernozem area, Siberia, and a number of other regions harvested the green mass without cobs of waxy and milky-waxy ripeness, because crops were crowded and other agrotechnical violations were committed. At the same time, the moisture of the silaged mass was not regulated everywhere through the admixture of other components, including straw and glume. Meanwhile, for example, the Druzhba Kolkhoz in Krasnodar Kray and many other farms in the Kuban, for the purpose of balanced livestock feeding during the fall period and the procurement of high-grade silage, widely utilize both basic and secondary afterharvest sowings of multicomponent mixtures of fodder crops consisting of Sudan grass, sweet sorghum, sunflower seeds, corn, and soybeans. This makes it possible to increase the green mass harvest per hectare by 15 to 20 percent and to raise the output of digestible protein by 25 to 30 percent. From a herd of more than 1,200 cows the kolkhoz obtains more than 4,300 kg of milk with a 3.98-percent fat content. This experience deserves to be widely applied in the country's other regions next year.



Taking into account the quality of procured silage and other feed, specialists of kolkhozes, sovkhoses, and agro-industrial associations in cooperation with workers of scientific institutions must determine the most efficient methods of utilizing feed resources and see to it that high-grade feed mixtures are prepared for all types and age groups of animals on every farm and at every livestock section. The utilization of feed prepared with the application of bacterial leavens and chemical preservatives should be taken into account especially. Hundreds of thousands of tons of silage have been stored with the application of chemical preservatives on farms in Latvia, Estonia, and Leningrad, Moscow, and a number of other oblasts. According to scientists' estimates, 30 to 40 feed units, 5 to 8 kg of protein, and 15 to 20 kg of sugar are additionally preserved in 1 ton of such silage. Feed obtained by means of a chemical preservation of freshly mowed and only lightly sun-dried leguminous and cereal grass is of special value. It most fully preserves all the properties of green grass and its nutritiousness and vitamin composition, which helps to obtain high milk yields and gains in the live weight of livestock with minimal grain fodder expenditures. This feed should be utilized primarily for young stock and cows whose milk yield is being increased.

Deliveries of chemical preservatives to rural areas increase year after year. They include acetic, formic, and benzoic acids, a mixture of low-molecular acids, sodium pyrosulfite, and a number of other domestically produced preservatives and imported preparations. Their application requires a careful preparation: personnel training and special additional equipment for feed harvesting combines, or stationary devices for a uniform mechanized application of a preservative to the mass stored for silage or haylage. Therefore, during the winter period it is necessary to organize people's training and the preparation of equipment and storage facilities so that chemical feed preservation may be expanded significantly in 1987.

The utilization of mixed silage should also be approached in a special manner. In the Ukraine and in oblasts, krais, and autonomous republics of the North Caucasus and the Central Chernozem Region, where wide experience in the storage of mixed silage has been accumulated, this type of feed occupies an ever greater proportion in hog feeding rations. At the same time, some specialists do not take into consideration the fact that it must be balanced without fail, primarily in terms of protein. After all, corn cobs of milky-waxy and waxy ripeness, root and tuber crops, waste of vegetable and melon crops, green grass mass, flax and clover glume, and cereal crop glume are basically utilized for the preparation of such silage. Therefore, such feed cannot fully meet the needs of animals for nutrients. It can replace up to one-third of concentrated feed.

Livestock breeders and specialists know well that root and tuber crops, that is, potatoes, carrots, sugar beets, and "kuuziku," produce a high effect in dairy cattle breeding when young stock is raised. Unfortunately, when harvests were low, it often was economically unprofitable to feed potatoes to livestock, because this sharply raised the production costs of milk. An increase in the gross output of potatoes this year makes it possible to more widely use them in the feeding of dairy cattle and hogs and, as a result, to attain the saving of grain fodder.

The use of mangel-wurzel and semisugar beets, as well as fodder carrots, in dairy cattle rations is now promising, because the mastering of advanced technologies and of the collective and family contract has enabled many farms to obtain 600 to 800 quintals of fodder root crops per hectare even without irrigation and up to 1,500 quintals of roots per hectare and more with it.

It is now important not to stop the work on feed accumulation everywhere and on every farm to make maximum use of the potentials for the collection and utilization of food industry waste and for the preparation of granules and pellets with the use of grass and coniferous meal, straw, and glume. In order to avoid interruptions in livestock feeding, feed must be delivered to wintering places and a strict recording and constant control of its expenditure should be organized.

The organization of an efficient expenditure of feed and its preparation for feeding is of great importance for a successful execution of wintering.

More than 85,000 feed shops and kitchens and kolkhoz, sovkhoz, and interfarm shops and enterprises for the processing of fodder grain and various feed additives will operate at livestock sections during the wintering of 1986/87.

Experience in the organization of efficient feed utilization and high-grade animal feeding has been accumulated on farms in all the country's regions. For example, on the Pobeda Kolkhoz in Kanevskiy Rayon, Krasnodar Kray, where about 11,000 head of cattle, including 3,200 cows and 9,000 hogs, are kept at livestock sections, all feed is fed only in prepared form all year round. This has made it possible to ensure high production indicators. In 1985 the milk yield per cow totaled 4,549 kg and 130 feed units were expended on the production of 1 quintal of milk.

On the Progress Kolkhoz in Volzhskiy Rayon, Kuybyshev Oblast, the entire cattle stock is provided with full-ration mixtures prepared at a feed shop of the KORK-15 type. A total of 4,200 kg of milk from each of the 1,550 cows were obtained there in 1985.

The feed shop on the Kolkhoz imeni Kalinin in Pervomayskiy Rayon, Crimean Oblast, operates highly efficiently. A total of 125 tons of feed mixtures are prepared here in 24 hours. In winter they include straw, fodder root crops, corn cobs, haylage, silage, mixed feed, and mineral additives. A mixture of the green mass of lucerne, corn, straw, concentrated feed, and mineral additives is prepared during the summer period. On the farm there are 670 cows. In 1985 the average milk yield totaled 3,494 kg. A total of 100 calves per 100 cows are obtained, 120 feed units per quintal of milk are expended, and the sector's profitability is 62 percent. The utilization of full-ration mixtures has made it possible to lower the share of concentrates in a cow ration to 20 percent.

On the Radyanska Armiya Kolkhoz in Kremenetskiy Rayon, Ternopol Oblast, the mechanized feed shop prepares 60 tons of a feed mixture per shift. It consists of silage, straw, haylage, fodder root crops, molasses, mineral additives, and concentrated feed. In 1985 on the farm an average of 3,709 kg



of milk per cow were obtained from 500 cows, the yield of calves was 94 head per 100 cows, feed consumption per quintal of milk was 107 feed units, the share of concentrated feed in cow rations comprised 23.4 percent, production costs per quintal of milk were 24.5 rubles, and the profitability of dairy husbandry made up 72 percent.

On the Brodovskiy Sovkhoz in Kamenskiy Rayon, Sverdlovsk Oblast, in 1985 the average milk yield in a herd of 1,200 cows was 3,489 kg. The preparation of full-ration feed mixtures at the feed shop made it possible to increase livestock productivity by 10 percent during the past wintering period. The feed shop makes it possible to balance the ration in terms of 20 nutrients. The mixture includes hay, straw, fodder root crops, silage, haylage, concentrated feed, molasses, and macro- and micro-elements. A total of 60 tons of four types of feed mixtures are prepared in 24 hours: for the milch herd, for cows whose milk yield is being increased, for dry cows, and for young stock. Prepared feed is delivered to animals and is fed four times a day.

The processing of grain into mixed feed and feed mixtures with the use of high-protein feed made of local raw materials is of great importance for an increase in the efficiency of concentrated feed utilization. Good experience in this matter has been accumulated in Belgorod Oblast, where 18 interfarm shops for the production of whole milk substitutes, 8 shops for the output of technical products made of meat waste, 2 dry fodder yeast plants, a dry mycelium shop, and an interfarm plant for the processing of vegetation gathered in forests and on unsuitable land have been established. All this enables the oblast's farms to additionally obtain 70,000 tons of feed units and 12,000 tons of digestible protein.

To balance rations, to organize high-grade feeding for highly productive animals, to increase milk yields and weight gains during fattening, and to improve herd reproduction indicators, the output of protein and vitamin additives containing 0.9 to 1 feed units and 300 to 360 grams of crude protein, as well as all the necessary micro- and macro-elements and vitamins in balanced form, per kg has been mastered in many rayons.

Since 1985 such additives have been produced at special installations on the Kolkhoz imeni Lenin in Novomoskovskiy Rayon, Tula Oblast, and on the Pobeda Kolkhoz in Kanevskiy Rayon, Krasnodar Kray. The products of these plants are delivered to 145 kolkhozes and sovkhoses in the RSFSR, where 121,000 highly productive cows with a milk yield of 4,000 kg and more are kept.

High-protein additives provide a real possibility of fully balancing the rations of highly productive cows in terms of all nutrients and of attaining a high livestock productivity. For example, 100 tons of an additive were utilized on the Pamyat Ilich Kolkhoz in Shchelkovskiy Rayon, Moscow Oblast. Each out of the 745 cows received 134 kg of it. In a year the farm ensured an increase of 182 kg in the milk yield per cow (up to 4,780 kg), the content of fat in milk increased by 0.04 percent, the yield of calves rose by four head, and the length of the service period was shortened by 5 days.

On the Kolkhoz imeni Gorkiy in Leninskiy Rayon, Moscow Oblast, where there is a herd of cows with an annual productivity of 5,343 kg, in 1986 during 20 days of animal lactation the use of high-protein additives made it possible to increase the milk yield per cow by 385 kg, or by 13 percent, and the content of fat in milk by 0.05 percent.

At the Rossiya Pedigree Stock Plant in Chelyabinsk Oblast by balancing a ration in terms of protein the average milk yield per cow increased to 5,006 kg with production costs of 28 rubles and expenditures of 110 feed units per quintal; at the Gulkevichskiy State Pedigree Stock Plant in Krasnodar Kray, 4,531 kg, 18 rubles, and 115 feed units respectively.

Many examples of efficient feed shop operation and good feed utilization can be cited. However, the available experience is not yet disseminated as rapidly as needed. For example, as during preceding years, in many oblasts in the RSFSR and the Kazakh SSR in late fall a significant number of feed shops were not yet ready for operation. Thus, from 20 to 25 percent of the feed shops were not promptly repaired and put into operation on farms in Khabarovsk and Altay krays and in Vologda, Kemerovo, Tomsk, Chita, and a number of other oblasts and one out of four, throughout the Kazakh SSR.

Serious claims must be lodged against technical repair enterprises of agroproms. Having a powerful material base at their disposal, many local subdivisions poorly utilize their capabilities, fail to keep feed shop repair and technical servicing schedules, and perform operations in a poor quality manner.

Cases of delays in the construction of feed preparation projects and of failures to keep their commissioning schedules are noted. Having a low provision of livestock sections with feed shops, the Uzbek SSR and Ryazan, Smolensk, Yaroslavl, Kostroma, and some other oblasts disrupted the plans for the delivery of these projects during the first half year of 1986. Such a state of affairs cannot be tolerated. Every kilogram of feed should be used only in prepared form--this should become the rule. For this it is necessary to put into operation new and to repair existing feed shops, to outfit them with the necessary equipment, to staff them with skilled personnel, and to ensure a trouble-free operation of feed preparing equipment in the shortest time. From the first days of wintering animals should be fed according to high-grade balanced rations.

A whole set of tasks are resolved during the period of preparation of livestock sections for winter and they are accomplished more successfully where this is taken care of in advance. For example, on the Rodina Kolkhoz in Volnovakhskiy Rayon, Donetsk Oblast, the repair of livestock barns and feed shops was completed by the middle of summer. A feed yard was equipped there near the livestock section and a feed storage facility for 1,000 tons of hay was put into operation. A general-service building with a restaurant, a store, a comprehensive receiving center for every-day services, a barbershop, and a sauna bath was built at the livestock section No 2. The same general-service building was built at the livestock section No 1 earlier. Hard-surface roads inside livestock sections were put in order. However, work was not limited to economic concerns alone. Extensive work on the formation of

stable collectives and on the creation of conditions necessary for highly productive labor and every-day life for them was carried out there. R. D. Ignatyeva and T. D. Krivchun, party group organizers at livestock sections, are engaged in this. Party groups have actively joined in the labor competition among livestock breeders for an increase in the production of products and for a prompt preparation of livestock sections for livestock wintering.

Livestock barns on the Udarnaya Leninskaya Brigada Kolkhoz in Belyayevskiy Rayon, Odessa Oblast, were prepared for winter in advance. Feed shops at dairy and hog breeding livestock sections were repaired and now they operate here, hard-surface roads and the House of Livestock Breeders were put in order, and rooms for psychological relief, a medical preventive clinic, and a receiving every-day service center were equipped. Most importantly, livestock sections were provided with sufficient feed. A total of 2.4 tons of hay, 2.5 tons of fodder root crops, and 12 tons of silage per cow were stored. In all 3,600 feed units per standard head of livestock were allocated. This created a firm basis for the further growth of animal productivity. A total of 2,117 kg of milk from 600 cows were obtained on the kolkhoz during the first half year. As compared with the same period of the preceding year, the increase amounted to 494 kg.

On most kolkhozes and sovkhoses livestock is placed in capital barns. However, on some farms some of the livestock is placed for winter in adapted barns. At the same time, the necessary construction and commissioning of new projects are not ensured everywhere. The plan for 6 months of 1986 for commissioning barns for cattle was fulfilled only 86 percent on the country's sovkhoses and 93 percent on kolkhozes; barns for hogs, 45 and 99 percent respectively. However, on farms in the Georgian, Moldavian, Tajik, and Armenian Union republics the plan for the construction of barns for cattle was fulfilled only 20 to 38 percent.

Provisions for preventive calf stall clinics are especially low. For example, farms in Belorussian, Georgian, and Latvian Union republics have less than one-half of their need for them. Here there are also not enough delivery departments at dairy cattle sections and not all barns are heated and prepared for winter. Therefore, it is necessary once again to carefully check the state of every livestock section and every barn and to promptly eliminate imperfections.

A regular electric power, heat, and water supply for livestock sections is of great importance to the organization of livestock wintering. In a number of oblasts in the RSFSR, the Ukraine, Belorussia, and Kazakhstan during the past wintering period there were numerous cases of suspension of electric power supply for livestock sections, which led to a sharp reduction in the productivity of animals and to the underproduction and spoilage of products. This cannot be tolerated. The adoption of exhaustive measures to put all livestock section equipment, power facilities, and engineering networks in proper condition and the completion of their repair and reconstruction should become urgent concerns of managers and specialists of kolkhozes, sovkhoses, and other enterprises of the agro-industrial complex. For the purpose of saving feed, fuel, and electric power, it is necessary to carefully heat

production and every-day facilities, to organize a reliable technical support for the operation of boiler rooms, heat generators, and refrigerating and other technological equipment, and to more widely enlist patronage enterprises and organizations in these operations. It is necessary to create the necessary zoohygienic and veterinary-sanitary conditions guaranteeing a full preservation of livestock and poultry and a reliable protection of livestock sections against the spread of diseases.

Experience shows that high production indicators are attained on kolkhozes and sovkhoses where constant attention is paid to problems of improving the organization and stimulation of the labor of workers at livestock sections and complexes, moral and financial incentive measures for an increase in output and a reduction in the consumption of material, labor, and power resources are widely utilized, and such advanced forms of labor organization as the collective contract and two-shift and two-cycle work regimes are introduced.

For example, in Cherkassy Oblast 1,324 (68 percent) out of the 1,951 production subdivisions existing in animal husbandry were transferred to the collective contract. In the oblast work was done on providing livestock breeders with housing and projects for social and every-day purposes, which made it possible to fully provide animal husbandry with skilled mass trade personnel.

The practical work of kolkhozes and sovkhoses in the country's various zones has shown that collectives of cost accounting brigades operating on the basis of collective contract principles receive the biggest return from available resources.

In 1983 the collective contract was introduced at the Zanki Dairy Cattle Section on the Sovetskaya Belorussiya Kolkhoz in Svislochskiy Rayon, Grodno Oblast. In 1985, as compared with 1983, the load of cows per worker increased by 39 percent, the productivity of animals rose by 684 kg, production costs per quintal of milk were lowered by 5 rubles, labor expenditures on the production of 1 quintal of milk decreased by 2.9 hours, and feed consumption per quintal of milk totaled 110 feed units.

On the Krasnyy Luch Sovkhoz in Shchelkovskiy Rayon, Moscow Oblast, the collective of the dairy livestock section working on the basis of a contract services 433 cows. A total of 5,590 kg of milk per cow were obtained in 1985. Expenditures of labor per quintal of milk totaled 2 hours and of feed, 90 feed units.

In 1985 the Terveti Kolkhoz in Dobelskiy Rayon, the Latvian SSR, obtained 6,147 kg of milk from each of the 1,024 cows. Expenditures of labor per quintal of milk were 2.6 hours and of feed, 110 feed units.

The collective contract is applied in a highly efficient manner in cattle fattening on farms in Grodno and Brest oblasts in the Belorussian SSR and in Penza, Saratov, Orenburg, and other oblasts in the Russian Federation.

On the Gigant Kolkhoz in Kuznetskiy Rayon, Penza Oblast, the livestock section collective works on the basis of a contract and fattens 5,300 head of young



cattle annually. The production and economic indicators of this complex improve constantly. In 1985, as compared with the preceding year, the average delivery weight per animal increased by 10 kg, totaling 419 kg, the average daily weight gain rose to 717 grams, and labor expenditures per quintal of gain decreased to 13.5 hours.

The high efficiency of the brigade contract in hog breeding can be seen, using as an example the Pobeda Sovkhoz in Sergiyevskiy Rayon, Kuybyshev Oblast, where 10,000 hogs are fattened annually. The livestock section has been operating by this method since 1984. The wages of operators, as well as of auxiliary workers and specialists, are made dependent on the results of plan fulfillment, as well as of the saving of feed and other direct expenditures. Whereas in 1984 before the transition to the contract average daily weight gains in feeder hogs totaled 401 grams, feed expenditures per quintal of weight gain, 670 feed units, and production costs per quintal, 113.53 rubles, in 1985 these indicators reached 476 grams, 550 feed units, and 91.93 rubles respectively. The average wages of livestock section workers rose 22 percent. The collective contract has made it possible to regulate the work day of hog breeders and to stabilize personnel and has created the conditions for raising people's cultural and occupational level.

As a rule, the contract collective utilizes advanced work regimes. In animal husbandry 6,300 kolkhozes and sovkhozes (626,000 workers) now operate on the basis of a 5-day work week and 4,900 farms (220,000 people) use a two-shift work regime and 17,200 farms (1.5 million people), a two-cycle daily schedule.

The practical work of many farms shows that the further improvement in the work and rest regimes of workers in dairy cattle breeding should be made primarily on the basis of the introduction of the most efficient variants of two- and one-shift two-cycle work into production.

Two-shift work in dairy cattle breeding has become widespread on farms in Moscow, Leningrad, Sverdlovsk, Gorkiy, and a number of other oblasts in the Russian Federation and the Ukrainian SSR.

This work regime has been applied during many years at the dairy complexes of the Petrovskoye State Pedigree Stock Plant, the State Pedigree Stock Plant imeni Vladimir Ilich, and the Zarny Kommunist State Pedigree Stock Plant in Moscow Oblast, where the annual milk yield per cow totals more than 5,500 kg.

Work according to a two-shift schedule is carried out efficiently at the dairy cattle sections of the Lensovetovskiy Sovkhoz in Leningrad Oblast, on the Istok Experimental Model Farm in Sverdlovsk Oblast, and on the Kekhtna Experimental Model Farm in the Estonian SSR, where a high productivity of animals is also attained.

The one-shift two-cycle work regime of milkmaids has become widespread. It makes it possible to increase the loads per worker and to raise labor productivity. The two-cycle daily schedule at livestock sections is applied at most dairy cattle sections in the Estonian SSR. The average milk yield per cow totalled 3,966 kg there in 1985. In the Lithuanian SSR, where the average

milk yield per cow totals 3,444 kg, with such an animal milking schedule the work day of 90 percent of the livestock section workers begins at 0700 to 0900 hours. A high productivity of cows (5,000 kg) with milking twice a day is attained at the Omskiy State Pedigree Stock Plant in Omsk Oblast, at the Kommunarka State Pedigree Stock Plant in Moscow Oblast, on the Ukraina and Kutuzovka experimental model farms in Kharkov Oblast, and on many other farms.

Under present conditions almost all dairy cattle sections have the opportunity of introducing advanced work regime technologies. However, a one-shift three-cycle work regime with milking cows three times a day has been applied at many dairy cattle sections until now. With such a regime the work day begins at 0500 hours and ends at 2100 to 2200 hours. The lengthiness and fragmentation of milkmaids' work day, owing to excessive trips to places of work, shortens the time for their rest, household work, children's education, and rise in their cultural level. These and other factors create difficulties in enlisting young people in work at dairy cattle sections.

Advanced forms of labor organization on kolkhozes and sovkhoses in Kursk, Orel, Pskov, Smolensk, Tambov, Ivanovo, and Kalinin oblasts in the Russian Federation and in the republics of the Transcaucasus and Central Asia are introduced slowly. In the indicated oblasts and republics on almost all farms cows are milked three times a day, but the productivity of the milch herd is lower than the average in the country.

The task of party organizations and farm managers and specialists is to accelerate the introduction of advanced work and rest regimes at all livestock sections.

Under conditions of animal husbandry intensification the need for highly skilled personnel increases immeasurably. Special concern should be manifested for them during the winter period. At the same time, on Kazakhstan's kolkhozes and sovkhoses, for example, the staffing of livestock sections with milkmaids annually makes up only 95 percent during the wintering period.

Agro-industrial associations and farm managers should pay attention to an immediate staffing of livestock sections with personnel.

Work with personnel must be kept under unremitting control. It is necessary to organize the training of livestock section workers in intensive production technologies and advanced methods of labor organization everywhere. Rural party organizations must send an additional number of party and Komsomol members to livestock sections, to establish party and party-Komsomol groups everywhere, and, where this is necessary, to approve party organizers. During this period political informers and propagandists are called upon to activate political mass work at livestock sections and to see to it that everything that is new and advanced in the socialist competition becomes available to all livestock breeders and that the production of livestock section products increases from day to day.

The creation of the necessary production and every-day conditions for livestock breeders is the most important task of the party organizations of

kolkhozes, sovkhoses, agroproms, and farm managers. The mistakes that occurred last year, when in a number of places there were serious shortcomings in trade, medical, every-day, and cultural services for livestock section workers and interruptions in the delivery of goods in daily demand and fuel, should not be allowed during the forthcoming wintering period. On many farms livestock section workers are poorly supplied with special clothing and footwear. It is necessary to look into these problems and to take measures so that at every livestock section all the conditions for highly productive labor are created and workers' needs are met promptly.

Trade-union and Komsomol organizations, deputy groups, and people's control posts should actively contribute to an improvement in the living and working conditions of livestock breeders during the winter period. They are called upon to implement specific measures to regulate the work time regime and trade, every-day, medical, and cultural services for livestock section workers and thereby to contribute to an increase in their labor and social activity and to the retention of personnel in production. For example, RSFSR kolkhozes and sovkhoses, jointly with public health, trade, and every-day service bodies, have built up and outfitted 3,300 new medical preventive clinics and medical centers, 6,700 trade centers, and 3,600 every-day service centers. More than 63,000 red corners, 27,500 rooms for rest and eating, and more than 54,000 shower-bath cloakrooms will operate at the republic's livestock sections during the winter period. The task is to see to it that such domestic accommodations are available on every farm and at every livestock section.

In August 1986 the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU, and the Central Committee of the Komsomol examined the results of past wintering in animal husbandry and considered it advisable to continue the all-Union socialist competition for successful livestock wintering and for an increase in the production and purchases of livestock products during the winter period of 1986/87. The attention of labor collectives at enterprises and organizations of the agro-industrial complex is drawn to the need for maximum utilization of the potentials of every kolkhoz, sovkhos, and livestock section for increasing the production of meat, milk and other products, raising labor productivity, improving qualitative indicators, fulfilling contractual obligations, and attaining high end results.

Party, trade-Union, and Komsomol organizations are called upon to widely expand the socialist competition for successful livestock wintering and for an increase in the production and purchases of livestock products. A healthy moral environment and an atmosphere of labor competition should be created in collectives of livestock sections. This will actively contribute to the fulfillment of the tasks set by the party for animal husbandry workers.

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## MACHINERY, EQUIPMENT

### EQUIPMENT MAINTENANCE, OPERATION, UTILIZATION DISCUSSED

#### Efficient Use of APK Machine-Tractor Pool

Moscow TEKHNIKA V SELSKOM KHOZYAYSTVE in Russian No 6, Jun 86 pp 3-5

/Article: "For the Machine-Tractor Pool of the APK -- Efficient Use"/

/Text/ A solution for the food problem has been defined as a priority task by the 27th CPSU Congress. A decisive change is needed in the agrarian sector -- such was the task assigned in the Political Report by the CPSU Central Committee to the party congress -- a change which will bring about a considerable improvement in the food supply during the 12th Five-Year Plan. The plans call for more than a twofold increase in the rates of growth for agricultural production. A complex of measures has been developed aimed at creating conditions for more thorough agricultural intensification and for a guaranteed production of goods.

This includes first of all a strengthening of the APK /agro-industrial complex/ logistical base.

At the present time, there are 3 million tractors, more than 800,000 grain harvesting combines and more than 30 million other machines and items of equipment in agriculture. Their overall value exceeds 60 billion rubles. At the beginning of 1986, the power engineering capabilities at kolkhozes and sovkhoses alone had reached approximately 530 million kilowatts, or 22.3 kilowatts per worker and 256.7 kilowatts per 100 hectares of arable land.

The power worker ratio for agricultural labor will increase further in the future. By the end of the five-year plan, the fixed capital at kolkhozes and sovkhoses will have increased by a factor of 1.5 and the power engineering capabilities -- by a factor of more than 1.5. In addition to quantitative growth, the technical level of the machines must also be steadily raised. This will make it possible to raise labor productivity to a considerable degree, shorten the schedules and improve the quality of the agricultural work being carried out.

In conformity with the decisions handed down during the congress, the most important obligation of workers attached to the agro-industrial complex is that of achieving maximum effective utilization of the capabilities of the existing and created potential and concentrating effort and resources in those sectors where they will produce the greatest results.

By 1990, the daily productivity of tractors, grain harvesting combines and transport equipment must be increased by 20 percent.

In recent years, as a result of measures undertaken, the use of agricultural equipment at kolkhozes and sovkhozes has improved somewhat. For the country as a whole, the average monthly output per conventional standard tractor has been raised to 7 conventional standard hectares, that is, the norm has been reached. The productivity of beet harvesting and corn harvesting combines and some other machines has been raised.

Higher indicators in the use of tractors are found on farms in Moldavia, Latvia, Lithuania and Estonia, where the average daily output per standard tractor during the 11th Five-Year Plan increased on the average by 4-6 percent compared to the 10th Five-Year Plan and amounted to 8.8-9.42 conventional standard hectares.

Fine indicators in the use of equipment are annually being achieved by the machine operators in Krasnodar and Stavropol krais, Rostov and Leningrad oblasts in the Russian Federation, Donetsk, Dnepropetrovsk and Kherson oblasts in the Ukraine and a number of oblasts in Belorussia and Uzbekistan.

In accordance with the results of the All-Union Socialist Competition for 1985, challenge red banners of the USSR Council of Ministers and the AUCCTU were awarded to the Latvian SSR, Tatar ASSR, Khabarovsk Kray, Voroshilovgrad, Brest and North Kazakhstan oblasts and also to 18 rayons in various zones throughout the country for having utilized their machine-tractor pools in an efficient manner.

Many kolkhozes and sovkhozes, by creatively employing progressive technologies and new forms for organizing machine utilization, achieved high indicators in machine output.

Thus, at the Sadovod Sovkhoz in Makushinskiy Rayon in Kurgan Oblast, the daily output per conventional standard tractor reached 11.9 conventional standard hectares, for a grain harvesting combine -- 15 and for a silage harvesting combine -- 7 hectares. Moreover, the expenditures for 1 standard hectare amounted to 4.7 rubles and fuel consumption was lowered by 11 percent. Compared to the norm, a savings of approximately 25 percent was realized in the repair of equipment. With high quality work being carried out and with a considerable savings being realized in material resources, the average daily output per conventional tractor was raised in 1985 to 10.8-11.8 standard hectares at the kolkhozes Zarya Kommunizma in Baksanskiy Rayon in the Kabardino-Balkar ASSR, Novo-Pokrovskiy in Kizilskiy Rayon in Chelyabinsk Oblast and Pervoye Maya in Dyatkovskiy Rayon in Grodno Oblast, at the Viytsiyems Sovkhoz in Valkskiy Rayon in the Latvian SSR and at many other farms. In accordance with the results for 1985, these workers were awarded challenge red banners of USSR Gosagroprom /State Agroindustrial Committee/ and the Central Committee of the trade union for workers attached to the agro-industrial complex for having achieved highly productive use of their equipment. In all, such banners were awarded to 72 kolkhozes and sovkhozes and to six rayon mechanized detachments for providing agrochemical services for agriculture.

Record labor productivity levels were established by many complexes, detachments and teams.

In 1985, over a period of 9 days, a harvesting-transport detachment at the Kolkhoz imeni Kalinin in Novomoskovskiy Rayon in Dnepropetrovsk Oblast headed by G.P. Yavor harvested an area of 397 hectares of grain crops and obtained 1,687 tons of grain. The daily output of each Niva combine assigned to the detachment amounted to 11 hectares and the productivity was 4.25 tons per hectare.

Combine operator M.M. Rubovoy at the Kuban Kolkhoz in Leningradskiy Rayon in this same oblast, using an SK-5 Niva combine, harvested 260 hectares of grain crops and obtained 954 tons of grain in just 14 working days, with the daily output thus being raised to 23.3 hectares.

Many such examples could be cited. They are to be found in every oblast, kray and republic. However, on many farms the equipment is being employed in an unsatisfactory manner. Thus, during the 11th Five-Year Plan, the daily output per standard tractor in the Azerbaijan SSR on the average amounted to only 6.02 standard hectares, in the Armenian SSR -- 6.17 and in the Tajik SSR -- 6.5 standard hectares. The tractor pools on farms in the Dagestan ASSR and in Novgorod, Pskov, Kalinin, Smolensk and some other oblasts in the RSFSR are being used in an extremely unsatisfactory manner. Here the daily output per standard tractor is 4.8-5.9 standard hectares. The output of grain harvesting and feed harvesting machines is low in many regions of the country.

For the country as a whole, the daily output of tractors and harvesting machines is increasing slowly and by no means is in keeping with the technical potential of the machines being delivered to the rural areas. During the 1975-1985 period, the average capability of one tractor increased by 23 percent and the proportion of powerful tractors of the K-700 and T-150K types increased by 15 percent. The reliability of the machines was raised and improvements were realized in the working conditions of the machine operators. The average daily output of a conventional tractor during this period increased by only 3 percent and that for a silage harvesting combine -- by 2.34 percent. The daily output for a cotton harvesting machine during this period even declined by 12 percent.

Today all of the sovkhozes and kolkhozes are equipped with the Niva SK-5, Kolos SK-6 and Sibiryak SKD grain harvesting combines. During the 1975-1985 period, the average capability of one combine increased from 4.4 to 5.6 kilograms of grain bulk per second, or by 17.2 percent; their technical level was also raised. At the same time, the daily productivity of the combines during this period increased by only 5 percent and in the Central Asian and Trans-Caucasus republics it even declined.

The principal causes of low productivity of the machine-tractor pools at many farms are unsatisfactory organization of the work of machine operators for carrying out agricultural operations, considerable machine idle time as a result of technical defects caused by low quality repair work and technical servicing and inadequate level of skills on the part of executive agents.

Observations carried out on a number of farms in the RSFSR reveal that losses in working time during a shift, caused by a low level of work organization and

machine idle time for technical reasons, amount to 18-20 percent for sowing operations and 22-28 percent for harvesting a crop. In 1985 the idle time of tractors throughout the country as a whole, caused by technical and organizational factors, amounted to 62.8 million tractor-days, or 14.7 percent of all of the tractor-days worked. This means that during the course of a year's time 423,000 tractors did not participate in operations and of this number 240,000 failed to do so because of technical defects. By way of comparison, it can be said that the tractor pool of such a republic as the Ukrainian SSR consists of 486,000 tractors.

During 1985, for the country as a whole, losses in working time during the grain harvest amounted to 1.25 million combine-days (or 6.2 percent), including 947,600 combine-days (or 4.7 percent) caused by technical failures.

A common shortcoming in the use of tractors and other agricultural machines is a low shift coefficient for their operation. According to data furnished in annual reports, over the past 5 years only 8-10 percent of the tractors and 8-9 percent of the motor vehicles at kolkhozes and sovkhoses throughout the country were operated in two shifts. In many republics and oblasts, the K-700 and K-701 tractors are operated in one shift.

In introducing high speed work regimes for their machine-tractor units, many farms are ganging the machines in an inefficient manner. Thus, in a majority of the northern and central oblasts of the RSFSR, tractors of the MTZ /Minsk Tractor Plant/ are being ganged for sowing purposes with one grain sowing machine, despite the fact that it is known that a double-drill unit makes it possible to raise the shift output by 25-30 percent, it ensures better quality sowing and it reduces fuel consumption. Moreover, insufficient use is being made of the tractive effort of caterpillar tractors for sowing purposes. Motor vehicles and tractor trailers are being employed in an extremely inefficient manner, especially during periods devoted to carrying out such mass operations as harvesting grain crops, laying in silage and shipping sugar beets. Thus the schedules for carrying out the more important agricultural operations still exceed to a considerable degree the agrotechnical schedules. For example, the duration of the period for harvesting grain and silage crops exceeds the optimum period in many zones of the country by more than a factor of 2.5, corn for grain and sugar beets -- by a factor of 1.8. More than 50 percent of the mechanized operations are being carried out with deviations from the agrotechnical requirements. In the final analysis, this is bringing about a substantial shortfall in agricultural output.

At the same time, a considerable number of machines in individual regions are not being employed in the agricultural operations and this is raising the output costs because of amortization deductions. For example, in 1985, during the period of spring field work in Turgay Oblast in the Kazakh SSR, more than 1,000 tractors did not participate in the operations, including 260 K-700 type tractors. In addition, 1,640 grain harvesting combines were not used for harvesting the crop.

A reduction in the level of mechanized operations in cotton production is arousing serious concern. In Chardzhou Oblast in the Turkmen SSR, the 1985 task for the machine harvesting of cotton was fulfilled by only 92 percent, in



Kortinskiy Rayon -- by 60 and in Karabakaulskiy Rayon -- by 77 percent. Incidents involving unsatisfactory use of cotton harvesting machines are also taking place in other oblasts throughout the republic. It is by no means an accident that the proportion of machine cotton harvesting work here is just slightly more than 50 percent, while the proportion of manual labor in agriculture exceeds 81 percent.

At the present time, a system of machines for the all-round mechanization of agricultural production for the 1986-1995 period and zonal farming systems have been developed. In addition, the development of operational technologies for the cultivation of agricultural crops is nearing completion. This means that the agronomic and engineering services in the rural areas have been provided with an important instrument for developing all-round plans for mechanization on each farm and in each rayon and oblast. During the 1986-1987 period, a requirement will exist for clearly determining the machine requirements of the farms and, on this basis, ensuring the economically sound formation of requisition-orders and distribution of the equipment being supplied by industry. Such an approach will make it possible to ensure more stable orders for industry and it will raise the responsibility of farm leaders and specialists for the efficient use of each machine.

Introduction of the experience accumulated by farmers in Ipatovskiy Rayon in Stavropol Kray, especially when converting mechanized brigades, complexes and teams over to the collective contract will ensure a considerable increase in the efficient use of equipment. However, on many farms serious shortcomings are being tolerated in the formation of complexes and detachments which tend to lower the effectiveness of their operation. Efficient operational plans and movement routes for the units are not always being prepared, field preparation work is not being carried out and technical and cultural-domestic services are not properly organized. Many complexes and detachments are not being staffed with sufficient machine operators for ensuring double-shift operations and this is lowering substantially the productivity of the units.

The experience of farms in Chelyabinsk and Mogilev oblasts in the use of production line-cyclical organization for the carrying out of mechanized operations is deserving of attention. Such organization makes it possible to establish a more efficient production process in field crop husbandry, it shortens the schedules for the carrying out of agricultural operations and it improves their quality, it increases the daily output of machines and it regulates the work regime and rest periods of machine operators. The use of the production line-cyclical method for organizing the carrying out of mechanized operations is one means for further strengthening and developing the principles of cost accounting and collective contract work.

A feature of the production line-cyclical method for organizing the carrying out of mechanized operations is the maximum concentration of material and labor resources in behalf of a limited number of operations carried out simultaneously and the assignment of dissimilar machines and implements to a group of machine operators. Such organization in the use of equipment produces the greatest results when there is a well developed intra-farm repair and servicing base and when this base functions in an efficient manner.

The experience of kolkhozes and sovkhoses which have converted over completely to the production line-cyclical method for organizing the carrying out of mechanized operations reveals that its use makes it possible to shorten the work schedules by a factor of 1.3-1.5 and to raise the daily output of the machines by 35-40 percent.

This experience has been disseminated extensively at kolkhozes and sovkhoses in Voroshilovgrad, Odessa, Sverdlovsk, Kurgan, Tomsk and a number of other oblasts.

During the period devoted to introducing the production line-cyclical method for organizing mechanized operations at a number of sovkhoses in Uyskiy, Yetkulskiy and Kunashakskiy rayons in Chelyabinsk Oblast, the daily output per tractor was raised by 2-2.4 standard hectares and the shift coefficient for their operation was raised by 25 percent.

At the Trud Gornyaka Sovkhoz in Krasnodonskiy Rayon in Voroshilovgrad Oblast, the introduction of this form for organizing mechanized operations made it possible to raise the daily output per tractor from 7.2 to 8.6 standard hectares. In the process, the coefficient of shift operation was raised from 1.18 to 1.62.

The experience of farms which introduced this production line-cyclical system into operations has shown that it can be mastered successfully only with concentrated effort on the part of the agronomic, engineering and economic farm services. In addition, the farm leaders must display a high degree of interest in the system and considerable assistance must be furnished by the rayon agro-industrial associations, especially in such matters as production planning, the assignment of equipment and the formation of worker collectives.

A most important condition for raising the productivity of the machine-tractor pool and the quality of fulfillment of mechanized operations is a high level of knowledge and professional expertise on the part of the executive agents and especially the machine operators. There is good reason for the machine operators being referred to as the principal figures in the rural areas and the saying "If you live in the countryside, master the profession of machine operator" has become an inflexible rule for many rural youth and graduates of schools.

Machine operators require an especially high level of knowledge and professional expertise for mastering the intensive technologies for the cultivation of agricultural crops.

The technical literacy of machine operators must be combined with their agronomic training. The availability of such knowledge will make it possible not only to achieve a high output in the carrying out of a particular type of work, but in addition it will ensure growth in productivity and a reduction in expenditures for the production of a unit of product. Such is the opinion of A.V. Gitalov, two-times Hero of Socialist Labor, State Prize winner and leader of a tractor brigade at the Kolkhoz imeni XX Syezda KPSS in Novoukrainskiy Rayon in Kirovograd Oblast.

Today this constitutes one of the important tasks the solutions for which are being sought by all teams and services of the APK /agro-industrial complex/,

including rural general educational schools, SPTU's /rural professional-technical schools/ and specialists and leaders of farms and the rayon agro-industrial complex.

The number of 1st and 2d class machine operators in the country has reached 63 percent and at kolkhozes and sovkhoses in the Ukrainian SSR, Moldavian SSR, Belorussian SSR, Lithuanian SSR -- 65-74 percent. However, the system for training mechanized personnel in SPTU's and production-training combines is still not in keeping with the modern requirements.

At schools and combines, there is still a shortage of new machine models and the availability of modern full-scale models and placards is extremely inadequate. Very little literature is being produced that serves to describe the principal characteristics embodied in the design of a machine, operational failures and the methods to be used for correcting them. The faulty practice of assigning obsolete machines to young machine operators has still not been eliminated on many farms.

The experience of leading farms reveals very convincingly that young machine operators should be assigned new machines and experienced workers to serve as tutors. Moreover, they should be utilized in those areas where group operation of equipment is being employed and where work is organized on a collective contract basis.

Regular year-round employment, normal working conditions and stable earnings are today considered to be some of the more important criteria affecting the interest of machine operators in their work and their retention on the farms. Thus it is very important for each farm to have an annual calendar plan-schedule for the use of each machine operator, one which defines the proportion of his participation in carrying out the overall volume of work. The experience of leading farms reveals that this alone can reduce the man-power requirement by 12-15 percent. Moreover, tremendous importance is being attached to having the machine operators learn a second profession.

Today, with youth constituting a large portion of the machine operators, the repair workshops, technical servicing points, motor vehicle garages and machine yards must be viewed not only as objects for the preparation and storage of equipment but also as the principal base for machine operator training and for providing them with practical knowledge. This mission of a technical base at any farm is equally important and responsible and thus its development warrants daily attention.

In solving all of these tasks, a great role will be played by those engineering and technical workers who are called upon to implement the technical policies in the rural areas.

In addition to being technologists, the agricultural specialists are also production organizers.

Having developed the technology and having ensured the preparation of the equipment, they must instill in the specialists a conscientious understanding of the technological process.



At the present time, there are almost 400,000 engineers and technicians for the mechanization and electrification of agricultural production working at kolkhozes and sovkhoses. Many of them have become true organizers of agricultural production.

The achievements of the Kaskalenskiy Sovkhoz in Alma-Ata Oblast are known far beyond the borders of the Kazakh SSR. Each year this farm obtains high yields and fulfills the state plans for the production and sale of agricultural products. Highly productive use of equipment is one of the conditions for the successes achieved. Deserving of a great amount of credit in this regard is the sovkhos's chief engineer A.A. Valter. Chief engineers V.A. Zyuzukov of the Put K Kommunizmu Kolkhoz in Ramonskiy Rayon in Voronezh Oblast, V.M. Parshin of the Yekimovskiy Sovkhoz in Ryazan Oblast, A.M. Pachevskiy of the Rossiya Kolkhoz in Kalinovskiy Rayon in Vinnitsa Oblast, I.A. Volynets of the 40 Let Oktyabrya Kolkhoz in Ivanovskiy Rayon in Brest Oblast and many others, all proponents of scientific-technical progress in the rural areas, serve as fine examples of a thoughtful and creative approach being employed in the use of equipment.

At the present time, with the creative process of developing a single engineering service taking place in the rural areas, considerable importance is being attached to ensuring that skilled and knowledgeable specialists are available in all sectors, individuals who are capable of heading machine operator collectives and directing their efforts towards achieving the final results -- a sharp increase in field and farm productivity and the successful carrying out of the Food Program.

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#### Measures for Improving Equipment Utilization

Moscow SELSKOYE KHOZYAYSTVO ROSSII in Russian No 6, Jun 86 pp 27-29

Article by S. Karpotov, senior engineer of the Administration for the All-Round Mechanization of Field Crop Husbandry Operations and Organization of the Use of the Machine-Tractor Pool of RSFSR Gosagroprom: "With No Idle Time!"

Text Methods for improving the utilization of the machine-tractor pools of kolkhozes and sovkhoses

The intensification of agricultural production, as emphasized during the 27th CPSU Congress, must be carried out based upon scientific-technical progress, efficient use of agricultural equipment and the introduction of effective forms for administering, organizing and stimulating labor.

Recently, agricultural development has been characterized by rapid rates in strengthening the logistical base of kolkhozes and sovkhoses, by considerable growth in the volumes of mechanized operations and by an increase in the level of all-round mechanization in farming. However, the question concerning the effectiveness of use of available technical potential becomes more acute as an increase takes place in technical equipping.

Special importance is being attached to raising the effectiveness of use of the machine-tractor pool of kolkhozes, sovkhoses and other enterprises of RSFSR Gosagroprom State Agroindustrial Committee in the nonchernozem zone and

Siberia, where as a result of the natural-climatic peculiarities the growing season for the development of crops is very short. Thus, up to 60 percent of the field work here is carried out in the autumn, a figure which is twice as high as the average indicator for the Russian Federation.

There can be no doubt concerning the need for equipping and re-equipping the kolkhozes and sovkhoses with modern and highly productive equipment. But let us ask a question: are we making good use of the available equipment? Analytic materials on use of the machine-tractor pool of kolkhozes and sovkhoses during 1985 reveal that the average shift output per standard tractor was 7 hectares and the average daily output -- 7.2 hectares. This means that the entire tractor pool was operated on the average for just slightly more than one shift during a day's time. The average daily output for a grain harvesting combine was 9 hectares, that is, only three fourths of the norm. It must be borne in mind that the productivity of the machine-tractor pool, for a number of years, has remained practically at the same level while the expenditures for its maintenance have not declined.

As is known, statistics are based upon average figures. Moreover, in life and managerial practice, both leading and backward figures can be found in this work. The potential of available equipment is utilized most fully in those areas where extensive use is made of progressive forms for organizing utilization of the machine-tractor pool and where permanent cost accounting subunits (brigades, teams) that operate on the basis of collective contracts are created.

The collective contract is being introduced into operations more successfully on farms in Leningrad, Moscow, Belgorod, Saratov and Novosibirsk oblasts, in the North Osetian and Tatar ASSR's and in Stavropol and Krasnodar krais than it is in other areas. It comes as no surprise to learn that here, compared to previous years, a noticeable increase has taken place in labor productivity, output production costs in field crop husbandry have declined and the average shift output per standard tractor exceeded nine hectares.

Why is it not like this in other areas? Some leaders enjoy referring to weak technical equipping and soil-climatic peculiarities. But by no means do these references always reflect objective reality. For example, the average daily output per standard tractor on farms in Kuybyshev and Volgograd oblasts is 8.1 hectares, Penza Oblast -- 7.5, Leningrad Oblast -- 8.2 and in Novgorod, Pskov, Vologda and Smolensk oblasts -- only 6.1-6.2 hectares. The equipment is the same in these oblasts and the conditions for their use are roughly similar, but the organization of the work of machine operators and the engineering service is at different levels. In particular, the equipment at kolkhozes and sovkhoses in Kemerovo, Irkutsk, Chita, Vladimir, Kalinin, Ivanovo and Ryazan oblasts, where the average daily output per standard tractor is less than six standard hectares, is being used in an unsatisfactory manner.

In order to realize a maximum return from use of the machine-tractor pool, the standard of quality for the operation of existing and newly imported equipment at kolkhozes and sovkhoses must first of all be raised and the work of the entire engineering service in agriculture must be raised to a new level. Such an approach for this urgent problem derives from the decisions handed down

during the 27th Party Congress. And the new administrative structure for the agro-industrial complex is creating the organizational-economic base required for this.

Unfortunately, despite the fact that many specific methods for raising the effectiveness of use of equipment were long ago tested in actual practice, they are still not being employed in all areas. The work is being adversely affected by old methods of farm management and by reliance upon assistance mainly from the side rather than through the use of one's own resources. And indeed reserves are literally at one's feet.

According to data supplied by a normative-research station, the structure of working time for plowing, sowing and transport work carried out by DT-75 tractors is such that only 60 percent of the working time of a machine operator is spent carrying out the principal work, with the remaining 40 percent being used for correcting the many different types of organizational and technical problems. This is average data. And indeed there is a large group of farms at which less than half of the time is spent on the principal work. Thus it comes as no surprise to learn that during 1985 each tractor lay idle for 21 of the 191 days of annual working time because of technical or organizational problems. The percentage of equipment idle time was especially high on farms in Vologda, Vladimir, Ivanovo, Kirov and some other oblasts, where 28-43 of every 100 tractors are constantly idle.

During technical servicing of the machine-tractor pool, the machine operators quite often devote very little attention to the agricultural machines, the technical servicing of which is carried out neither completely nor in a timely manner. The work of adjusting the working organs of soil cultivation, sowing and harvesting machines is being carried out in a very weak manner and this is increasing to a noticeable degree the possibility of unforeseen breakdowns.

This is why, under the new conditions, the engineering service of kolkhozes, sovkhozes and RAPO's /rayon agro-industrial associations/ must devote maximum attention to reducing the amount of time spent in an unproductive manner and also to eliminating equipment idle time. Can the use of tractors and combines be improved? Beyond any doubt, it can and must be improved. And, as already mentioned, there are many means for doing so. We will mention only those which exert a direct influence on the effectiveness of use of the machine tractor pool.

The achievements of leading kolkhozes and sovkhozes and also individual rayons and oblasts clearly reveal that the use of the machine tractor pool improves sharply when a number of conditions are met: skilful organization of labor, the introduction of progressive methods for the cultivation of agricultural crops and the creation of fine production and cultural-domestic conditions for the machine operators. In addition, a considerable increase is realized in the labor productivity of the machine operators. And this is achieved by means of a collective contract for the machine operators.

For example, last year 1,914 brigades and teams operated on the basis of a collective contract in Moscow Oblast. They cultivated more than 53 percent of all of the sowing areas. The contract was employed most successfully at the

Kolkhoz imeni Gorkiy in Klinskiy Rayon, the Yakhroma Sovkhoz-Technical School in Dmitrovskiy Rayon, at the Sergiyevskiy, Zaokskiy and Povadinskiy sovkhoses and at some others.

The experience of these farms once again confirms the fact that not only does labor productivity increase in contractual brigades and teams, but a reduction also takes place in the calendar periods for the carrying out of field work, since each member of a brigade or team is interested in obtaining high yields with reduced production costs per unit of product. The machine operators make maximum use of the capability of each tractor, they select the speed of movement and swath width depending upon the specific conditions and they employ multiple-purpose units which can carry out several operations during just one run. In addition, they strive to eliminate equipment idle time caused by organizational and other factors.

Last year, each hectare of arable land assigned to contractual collectives at the mentioned farms furnished 35-40 quintals of grain, 200-220 quintals of potatoes, 500-550 quintals of vegetables and 600-700 quintals of root crops. The average daily output per standard tractor increased to 9 hectares and large savings were realized in the use of fuel and lubricating materials.

Collective forms for organizing labor also made it possible to solve the personnel problem. By combining operations and ensuring efficient ganging of machines on the same fields, success was achieved in raising sharply the effectiveness of equipment utilization, a reduction took place in the number of people engaged in carrying out various agricultural operations and the quality of the agricultural practices was raised.

At the Tikhoretskiy Sovkhoz in Krasnodar Kray, as a result of skilful organization in use of the tractor pool, the average daily output reached 12.6 standard hectares and the production cost for cultivation work was 4 rubles and 47 kopecks. Program-courses for improving the skills of machine operators are offered here annually. As a result, 76 percent of the overall number of machine operators are 1st or 2d class specialists. The technical servicing of the machine tractor pool is carried out by two expert trouble-shooters, each of whom is assigned 27 tractors. There is also a dispatching point and two refueling specialists. An operations engineer exercises control over the carrying out of technical maintenance and supplying the machines with fuel and lubricating materials. The work of the machine tractor pool is analyzed monthly by an economics department. An important factor with regard to raising the effectiveness of use of equipment is the personal assignment of equipment to the machine operators and strict accounting of the resources expended for equipment maintenance and repair. Examples of the documents employed for carrying out these measures are furnished below.

Hence, a conclusion comes to mind. The new status for the RAPO's has not only expanded their rights. The responsibility of these subunits for the final production results has also been raised. The economic and engineering-technical services of rayon agroproms /agroindustrial committees/ must carry out more active propaganda and explanatory work in this regard. And one of the most important trends in this activity must be effective practical assistance for the kolkhozes and sovkhoses in introducing the collective contract for the cultivation of agricultural crops and also for procuring feed, as a factor



which raises the productivity of the machine tractor pool and increases considerably the average shift output per standard tractor.

The form for the production line-cyclical carrying out of mechanized operations in field crop husbandry, which is one means for strengthening and developing the principles of cost accounting and collective contracts, exerts a substantial influence with regard to improving the utilization of agricultural equipment. It is based upon the use of a maximum concentration of equipment and labor resources for a limited number of operations that are being carried out simultaneously. The Donguzlovskiy Sovkhoz in Chelyabinsk Oblast was one of the first to employ this form of labor organization. The experience accumulated by this farm is now being employed by a majority of the kolkhozes and sovkhozes in the oblast. As a result, the accrued operating time of DT-75 and T-4 caterpillar tractors was raised here by 25-35 percent and the average daily output of the MTZ type tractors -- by 50 percent. At the Donguzlovskiy, Amineyevskiy sovkhozes and at the Yuzhnyy Ural Kolkhoz in Troitskiy Rayon, it amounted to 8.6, 8.3 and 7.8 standard hectares, compared to an average of 5.3 for the oblast as a whole. The output of grain harvesting combines and complex feed harvesting combines and machines increased considerably. The duration of the grain harvest was shortened by 30-35 percent and that for autumn plowing -- by 10-15 percent.

At the same time, it should be remembered that the introduction of the production line-cyclical method for organizing utilization of the machine tractor pool and, on this basis, increasing the gross output volumes of field crop husbandry, requires a great amount of organizational work and strict control on the part of the local organs.

It bears mentioning that the conversion of agricultural production over to a higher organizational level and the introduction of industrial technologies require constant improvements in the technological management over the course of this work. Towards this end, extensive use is being made on the farms of technological charts for the cultivation and harvesting of agricultural crops and schedule-plans developed for particular work periods.

Despite the importance of the mentioned facts, all of which exert a direct influence on the highly effective use of equipment, the chief one has always been and continues to be the availability of permanent and highly skilled machine operator personnel. Sufficient attention is still not being given in all areas to their training, retention in the rural areas or to raising their professional expertise.

At the present time, there is an average of 116 machine operators for every 100 tractors in the Russian Federation. This is not very many. However, the situation is even critical in 22 oblasts: here there are fewer operators than there are tractors. Work concerned with improving the qualifications of the tractor operators is being carried out very slowly. Today, 1st and 2d class machine operators constitute 65 percent of the overall number of workers in this profession. If the plan is to have a tractor operator 1st class produce 25 percent more output than a tractor operator 3d class, then the task over the next few years will consist of increasing the training of 1st and 2d class machine operators at each kolkhoz and sovkhoz to 70 percent of their overall number.

The availability to the farms of the facilities of a repair and servicing base can exert a substantial influence with regard to improving the use of equipment. There are still many farms which lack repair workshops, technical servicing points and machine yards equipped for the storage of equipment.

At existing farm workshops and technical servicing points, the technology for repair work is not fully worked out and the working positions are only weakly equipped with instruments, devices, shelves and benches. Certainly, this can only have a negative effect on the quality of equipment repair work. And it is by no means an accident that there are on the average 105-110 capital and current repair operations for every 100 tractors and for 100 grain harvesting combines -- 90. These figures are considerably greater than the norm.

It bears mentioning that the organization of correct equipment storage at kolkhozes and sovkhoses is a component part of the overall planned-preventative system of technical servicing and is of considerable importance for improving the use of the machine tractor pool.

In this regard, the rayon agro-industrial associations must make more active use of the rights and opportunities extended to them by the new administrative structure for the APK and they must undertake all of the measures required for ensuring that in future years each farm will have a standard workshop, a technical servicing point and a machine yard equipped for the storage of equipment.

The task consists of ensuring that kolkhoz and sovkhos leaders and engineering-technical personnel attached to RAPO's in all areas raise the level of organizational work associated with highly effective use of the machine tractor pool and, on this basis, ensure the development of high agricultural crop yields and a considerable reduction in expenditures for equipment maintenance.

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## MACHINERY, EQUIPMENT

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### MINISTER DISCUSSES TRENDS IN AGRICULTURAL MACHINERY

#### Poor Quality of Machinery

Moscow EKONOMIKA SELSKOGO KHOZYAYSTVA in Russian No 10, Oct 86 pp 10-18

[Article by A. Yezhevskiy, USSR minister of tractor and agricultural machine building: "Retooling Policy"]

[Text] The political report of the CPSU Central Committee to the 27th Party Congress stated the following: "The Soviet people should feel the results of joint efforts for a fundamental solution of the food problem in a short time..." Of course, workers at the agro-industrial complex, in particular at enterprises of the Ministry of Tractor and Agricultural Machine Building, should make the basic contribution to this.

Tractor and agricultural machine building belongs to sectors determining scientific and technical progress in agriculture and the solution of a number of important social problems in present-day rural areas. The rates of agricultural production retooling, scale of application of soil protective farming systems and of industrial and intensive technologies of agricultural crop cultivation, shortening of the time of performance of basic field operations and, as a result, reduction in harvest losses, and decrease in the share of heavy manual labor now depend largely on machine builders.

Specific work in this direction was done in the sector during the 11th Five-Year Plan, which had a positive effect on strengthening the material and technical base of kolkhozes and sovkhozes. Whereas at the beginning of 1981 enterprises of the system of the Ministry of Tractor and Agricultural Machine Building produced 527 types of machines, by the beginning of 1986, a total of 679. During 5 years the farmer's arsenal was replenished with more than 1,600,000 tractors, 561,000 grain harvesting combines, and other agricultural machinery worth 13.4 billion rubles, the share of new machines with higher technical and economic indicators rising continuously in the total volume of output. For example, in agriculture in 1985 there were 2,800,000 tractors with a total power of 235 million hp. In 1980 these indicators surpassed similar indicators by 10 and 23 percent respectively. At the same time, the share of power saturated tractors in their total pool increased from 17.6 to 30.5 percent and the average power of such a tractor rose by 13 percent.

The work load of power saturated tractors increased and the sphere of their application expanded as a result of the significant growth of the output of mounted and trailed machines (the so-called trail) integrated with them. In 1985, as compared with 1980, the production of all agricultural machines in the sector increased by 26 percent and of the trail, by 76 percent. A total of 393 new designs were developed and modernized, the production of 171 new machines was mastered, and 71 obsolete models were removed from conveyers.

The productivity (width of cut, lifting power, and capacity) of new machines is higher than that of those produced. For example, the KSK-4-1 four-row self-propelled potato harvesting combine harvests potatoes from an area of 0.83 to 0.89 hectares per hour, while its predecessor--the KRU-2 trailed two-row combine--only from 0.32 to 0.43 hectares. The productivity of the RUM-8 machine for mineral fertilizer application is 7.1 tons per hour, while that of the model replaced with it, only 3.8.

The productivity of the most important types of agricultural machines produced in 1981-1985, on the average, rose by 10 to 25 percent, their material intensiveness decreased by 6 to 10 percent, and the time between failures increased by 25 to 50 percent. This indicator almost doubled in the SZU-3,6 seeder, KRS-5,6A, KRG-3,6, and KOR-5,4 cultivators, the PS-10 seed treater, sprinkling machines, and the OVT-1V sprayer. The time between failures of the MTZ-80/82 tractor and of the D-240 engine for it increased to 9,000 hours and of T-150K, T-130M, DT-75MV, and T-25A tractors and of the engines for them, to 8,000 hours. The norms of consumption of spare parts for the T-130M tractor and for most agricultural machines were lowered.

The structure of the produced machines has changed significantly. The sector has begun to produce more wide-cut soil cultivating and sowing units of hitchless models. This makes it possible to significantly shorten the time for the transfer of equipment from a working into a transport position and back, especially during turns. When wide-cut hitchless subsurface and KPSH-9, KShU-12, and KShU-18 cultivators are used, the time required for these operations is one-fifth to one-seventh of the time needed when similar hitch units are used. Work on developing hitchless implements with a width of cut of 10 meters and more has expanded. Kolkhozes and sovkhozes have begun to receive new wide-cut harvesters and the PCh-4,5 chisel plow designed for the basic cultivation of soil at a depth of up to 30 cm, as well as for loosening its underground layer at a depth of 45 cm. Farms have obtained the first batches of standardized LKS-20 lines for the postharvest cultivation of table root crops and UDK-30 lines for the postharvest cultivation of heart cabbage, grain cleaning and drying sets, machines for the preplanting treatment of bulbs during the cultivation of bulb onions, 12-row plant feeding cultivators, 6-row potato planters with an upgraded hopper, lines for the removal, washing, and drying of cucumber and melon crop seeds, and so forth.

The concluding year of the 11th Five-Year Plan was especially successful. During it, workers at the enterprises and organizations of the Ministry of Tractor and Agricultural Machine Building, having widely expanded the socialist competition in honor of the forthcoming 27th CPSU Congress, attained the envisaged goals ahead of schedule. It can be stated with confidence that the results of 1985 are due to the increased labor and political activity of



collectives in response to the new party policy and to the sharp and decisive turn begun after the April (1985) Plenum of the CPSU Central Committee to overcome negative tendencies in the economy and social life and to strengthen discipline and order.

A total of 613 tractors, 270 tractor cultivators, 1,465 mineral fertilizer spreaders, 1,095 grain, 171 potato, and 117 sugar beet harvesting combines, 439 windrow harvesters, 80 grain cleaning and 172 sugar beet harvesting machines, and 1,172 tractor trailers were delivered to agriculture in excess of the set assignments last year.

The development of the highly productive Don-1500 grain harvesting combine produced at the Rostselmash Production Association imeni Yu. V. Andropov was completed at the beginning of 1986. Its productivity is 11.3 to 12.9 tons of grain per hour. It is designed for the straight and swath harvesting of cereal and groat crops. When the combine is equipped with special devices, it can harvest leguminous, oil-seed, and other small-seed crops, as well as corn and grass seeds. Its comfortable cabin is equipped with a conditioner and a seat regulated according to the machine operator's height. Sensors for automatic electronic monitoring of technological processes are installed on all the working elements of the combine. The Don-1500 combine replaces 400,000 machine operators.

The new DT-175S Volgar power saturated caterpillar tractor is the creation of the collective of the Volgograd Tractor Plant. In its productivity this high-speed comfortable machine surpasses the produced model twice. Its specific pressure on soil is not big.

The T-30 tractor developed at the Vladimir Tractor Plant is 1.5-fold more productive than the presently produced tractor. The system of mounted implements integrated with it makes it possible to increase the number of types of operations performed in fields, orchards, and hothouses from 80 to 120. The increase in durability and reliability and the decrease in fuel and oil consumption make it possible to lower operating expenditures by more than 50 million rubles per annual output of tractors. These figures were cited at the 27th CPSU Congress.

The development of the following new tractors was also completed by the beginning of the current five-year plan: the MTZ-142 universal row-crop class-2 tractor, the MTZ-82R tractor for rice cultivation, the MTZ-80Kh2M tractor for cotton cultivation, the Don-1200 grain harvesting combine, the ZhVR-10-03 self-propelled windrow harvester, a number of machines for the cultivation of grain crops, rape, mangel-wurzel, corn, potatoes, flax, cotton, and other crops according to intensive and industrial technologies, machines for the application of mineral fertilizers to soil and for chemical plant protection, and sets of machines for motor units and small-size class-0.2 tractors.

However, a significant economic effect from the application of agricultural equipment was also attained during the 11th Five-Year Plan. For example, in 1985, as compared with 1980, the power-worker ratio in agriculture increased by almost 50 percent. Labor expenditures on the production of 1 quintal of

products decreased, that is, of grain (without corn), by 1.1 man-hours; of raw cotton, by 1 man-hour; of flax straw, by 5.7 man-hours; of potatoes, by 2.7 man-hours. On the average, labor productivity in agriculture increased by 27.3 percent. A total of 70 types of new machines for the mechanization of labor intensive operations previously performed manually were developed during 5 years. They include a machine for picking raw cotton from open cotton bolls of fine-fiber cotton varieties, a set of machines for harvesting selective sugar beet crops, a flax portion-forming pick-up, a hemp pick-up, a photoelectronic unit for tomato sorting, a cucumber harvesting machine, and so forth.

However, the indicators cited here and other indicators characterizing the operation of the enterprises and organizations of the Ministry of Tractor and Agricultural Machine Building during the past five-year plan would have been much more modest if not for the significant qualitative shifts in the scientific and production potential of the sector itself during that time. The implementation of the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Further Rise in the Technical Level and Quality of Machinery and Equipment for Agriculture, Improvement in Their Utilization, and Increase in Their Production and Deliveries During 1983-1990" contributed to these positive changes. This document envisages ensuring the development of designs and mastering of the production of new and modernized highly efficient equipment in accordance with the system of machines for an overall mechanization of agricultural production and determines the ways of developing the sector itself and of creating the scientific and production base necessary for the fulfillment of this most responsible party and government assignment.

The high targets demanded a new approach to the determination of the sources of economic growth. The path toward a fundamental improvement in efficiency indicators lies in accelerating scientific and technical progress. We directly connect the realization of this basis for the party's economic strategy with the reorientation of investment policy and with a sharp increase in the share of capital investments in the reconstruction and retooling of existing enterprises. The task of maximally accelerating the replacement of productive capital, of getting rid of its obsolete part more rapidly, and of raising the shift coefficient of modern advanced equipment was set. The share of equipment with the application of microprocessor hardware will increase sharply and the level of automation of planning and design work will rise.

The Ministry of Tractor and Agricultural Machine Building received the capital investments and material and technical resources necessary for this. About two dozen major, new enterprises are now being built in its system simultaneously and reconstruction and retooling are being carried out at 147. Preference is given to the construction and reconstruction of projects meeting the most acute top-priority needs of rural areas and creating the prerequisites for the transfer of the most labor intensive agricultural operations to an industrial basis, that is, projects for the output of energy saturated tractors and of the trail of machines for them, of highly productive combines, of equipment for the application of soil protective and intensive technologies of cultivation of agricultural crops, and so forth.

In 1984 the Politburo of the CPSU Central Committee examined the problem of building plants for the output of universal row-crop 150-hp tractors, as well as of diesel engines and fuel equipment for them. The plants are to be built in the city of Yelabug in the Tatar ASSR in a complex with dwelling houses, municipal service projects, and projects for cultural and every-day purposes for future workers. The first buildings both in the industrial and in the civil zone are already being constructed here. The construction of such plants will be an important condition for a successful realization of the country's Food Program and for the further rise in the scientific and technical level of agricultural production on the basis of its retooling with highly efficient equipment.

In essence, if we compare existing fixed productive capital of tractor and agricultural machine building in value terms with that being developed, the second sector for the production of tractors and machines for plant growing will be established on a qualitatively new basis, on the basis of the most modern equipment and the most advanced technology, in 8 years (1983-1990), that is, by the end of the current five-year plan. Suffice it to say that about 1,500 advanced technological processes were introduced at the plants of the Ministry of Tractor and Agricultural Machine Building during 1981-1985.

The rise in the technical level of production could not but be reflected in the technical level of output. For example, in 5 years the reliability of grain harvesting combines increased 1.5-fold and, at the same time, the metal intensiveness of Niva was reduced by 6.4 percent and that of the KSKU-6 corn harvesting combine, by 15.5 percent. The PLN-4-35 plow became 11.9 percent and SZ-3,6 seeders 8.6 percent lighter. In 1985 the actual output of products in the highest quality category exceeded the planned output by 3 percent.

Such are some results of the work of enterprises in the system of the Ministry of Tractor and Agricultural Machine Building during the 11th Five-Year Plan. However, they do not evoke a sense of complete satisfaction in workers in tractor and agricultural machine building. Whereas previously we could have been content with generally satisfactory, but intermediate, results for the sector, now we strive to compare these results with final ones, that is, with the extent to which the needs of agricultural production for equipment are fully met and the extent to which machines fully meet the requirements made by rural workers for their technical level and quality of manufacture. After the 27th CPSU Congress, when all the sector's labor collectives tried to answer these questions self-critically, in the spirit of present party demands, many ordinary, familiar shortcomings and problems accumulated for years were illuminated in a new way.

Thus, the poor reliability of tractors and agricultural machines is one of the significant shortcomings lowering their technical level. The transmissions of T-70S and DT-75ML tractors do not meet durability standards. The time between complicated failures in T-16M, MTZ-80Kh, and other tractors is 1.3 to 2.5-fold lower than the standard. The mean time between failures in most agricultural machines is low. In 15 out of 19 tractor makes and in many agricultural machines assignments for lowering the specific structural metal mass have not been fulfilled.

For the low quality of output the Ministry of Tractor and Agricultural Machine Building was subjected to sharp criticism contained in speeches by a number of delegates to the 27th CPSU Congress. Mass information and propaganda bodies often criticize us for this. They justly criticize us for Altay engines, Odessa plows, Melitopol hydraulic units, and Noginsk fuel equipment. This list can be continued more and more. Although a forward step in solving the equipment quality problem was made during the 11th Five-Year Plan, the results do not calm, but conversely, worry us, because for the time being it is a matter of reducing claims, the return of equipment, and losses due to rejects and of increasing the output of products in the highest quality category only by several percent, not severalfold, or at least by many dozen percent.

It is well known that quality is born at the designer's Kuhlman drafting unit. However, plant defects, that is, nonobservance of the dimensions and surface finishing of parts and the low quality of fasteners, castings, heat treatment, welding, assembly and adjustment of subassemblies and units, and painting, are added to the structural shortcomings noted during state tests of a new model, which are by no means always fully eliminated when equipment is placed in production. The flaws of subcontractors delivering accessories and materials are added to our flaws. We are now organizing a strict 100-percent receipt control of the quality of products received on the basis of intra- and inter-sectorial cooperation at all enterprises.

During the past 5-year period the ministry did not fulfill the plan for the development and output of the first industrial batches and series output of a number of agricultural machines, some of which form part of the trail of implements for power saturated tractors. The 12th Five-Year Plan envisages eliminating the lag that has been tolerated by 1988. During 1986-1990 we have to develop structures and to master the production of no less than 386 new and modernized technical facilities, including 16 models of tractors for an overall mechanization of key types of operations, a trail of 26 machines for power saturated K-701- and T-150-type tractors, and sets of 14 machines for the application of intensive grain crop cultivation technology, of 16 machines for harvesting grain crops and processing them on a stationary base, of 8 machines for the application of soil protective technologies of agricultural crop cultivation, of 17 machines for the application of industrial potato cultivation technology, and of 15 machines for the application of intensive cotton cultivation technologies.

The Basic Directions in the Economic and Social Development of the USSR for 1986-1990 and for the Period Until the Year 2000 approved by the 27th CPSU Congress envisaged delivering 1,900,000 tractors, 1,770,000 tractor trailers, and agricultural machinery and equipment worth no less than 43 billion rubles to agriculture during the 12th Five-Year Plan. By 1990 we will have to produce 1,065 types of tractors and agricultural machines and to meet the need of agriculture for plows, seeders, cultivators, and deep digging subsurface tillers integrated with power saturated tractors 100 percent and the need for machines for mineral fertilizers, 85 percent. Whereas at present the plowing, sowing, and harvesting of grain crops and a number of other operations are fully mechanized, by 1990 the overall mechanization of sugar beet, potato, and flax harvesting will be completed fully, cotton harvesting and crop irrigation, 80 percent, vegetable crop harvesting, 60 percent, and so forth.



New-generation equipment will come to fields: the Volgar DT-175S power saturated caterpillar tractor, the highly productive Don grain harvesting combine, the rotor-type SK-10 combine, new and modernized MTZ-100/102 and MTZ-142 tractors, the wide-cut self-propelled ZhVR-10-03 harvester, the highly productive Step harvesting complex, the ZhRS-5 self-propelled rice harvester, hitchless SZ-4, SZS-6, and SZS-12 seeders, BMSH-15 and BMSH-20 hoe harrows, KShU-12 and KShU-18 cultivators, RUM-16 machines for the application of mineral fertilizers, and many others. In productivity most of these technical facilities surpass the replaced analogs, which in combination with an increase in the number of machines will lower the need for manpower in rural areas by 4.1 million people (with due regard for the number of city dwellers drawn into field work) during the 12th Five-Year Plan.

We pay special attention to an increase in the output of the set of machines and the trail of implements for power saturated tractors, whose shortage was noted by M. S. Gorbachev in his speech at the meeting with workers in the city of Tolyatti. In 1990, as compared with 1985, with a total increase of 74.7 percent in the output of agricultural machines the output of the trail of machines for power saturated tractors will increase 3.6-fold and of machines for the application of soil protective technologies, 2.5-fold, for the preparation and application of mineral fertilizers to soil, 8.7-fold, for chemical plant protection, 3-fold, and for the application of intensive agricultural crop cultivation technologies, 2-fold.

A new family of standardized general-purpose plows of a modular design and increased reliability is now being developed. Their productivity is increased by 15 to 20 percent and the service life is extended up to 10 years. The metal intensiveness of a plow decreases by 13 to 15 percent and fuel consumption by the power facilities integrated with them, by 10 to 15 percent. At the same time, work on increasing the durability of plowshares and moldboards is accelerated no less than 1.5- to 2-fold. The production of various types of plow bodies for a highly efficient utilization in the country's various zones will be mastered.

High results are also expected from the replacement of other obsolete types of technical facilities with new-generation machines. As a result, the productivity of equipment in tilling will rise 26 percent, in cultivation, 1.8 percent, in sowing, 21 percent, in plant topdressing, 2.4-fold, in spraying, 2.4-fold, in harvesting (by the Don-1500 combine instead of the SK-5M Niva), 1.6-fold, in postharvest grain processing, 2.5-fold, and in mineral fertilizer application, 2.1-fold. The specific metal intensiveness of new machines declines from 8 to 44 percent and specific power consumption (fuel consumption), by more than 12 percent.

The June (1986) Plenum of the CPSU Central Committee noted that, for all practical purposes, the attainment of the highest world level of quality and reliability was not envisaged during the development of new equipment. At best developers emulated foreign series analogs, whose first models came off conveyers many years ago. Such a practice was also characteristic for a number of scientific research institutes and design offices in our sector. Such a situation is largely due to the fact that for a long time we have not

given scientific research and design organizations the attention they deserve. Today the situation is improving decisively. More extensive opportunities for the formation of a scientific and planning-design reserve, activation of scientists' labor, and increase in its efficiency are created. An extensive introduction of a system of tables of constantly renewed comparative characteristics of machines produced and developed by us and of the best domestic and foreign analogs has been developed and its extensive introduction has begun in the sector.

It should be noted that, in order to speed up the time of development of new equipment, a greater interaction between the institutes of the Ministry of Tractor and Agricultural Machine Building and USSR Gosagroprom is needed. A joint performance of scientific research and an integration of the scientific and technical potential of sectors would make it possible to shorten the time of equipment development by a minimum of 3 to 4 years.

Work on evaluating, analyzing, and raising the technical level and quality of produced and newly developed machines, especially such indicators as a 1.5- to 2-fold increase in reliability, a 20- to 30-percent decrease in the labor intensiveness of technical servicing, and so forth, has intensified sharply. We plan to increase the share of machines meeting or surpassing the world level in their total output to no less than 80 percent by the end of 1990.

The course of replacing the physical tests of the Don-1500 combine with stand tests is pursued. Thus, a stand for accelerated full-set tests of this combine make has been developed in the sector for the first time. All the basic machine subassemblies, including accessories, can be checked for reliability on it. Incidentally, the significant increase in the number of stands and of the subassemblies and units tested on them planned for the current 5-year period will make it possible to conduct tests irrespective of the weather and the time of the year and, consequently, will speed up this stage in the development of new equipment severalfold and shorten the total period of its production.

By 1990 the productivity of agricultural machines and machine-tractor units is to be increased 1.5- to 2-fold, their specific metal intensiveness is to be lowered by 12 to 18 percent, on the average, and the life of tractors and engines is to be brought up to 10,000 or 12,000 motor hours before major repairs. Specific fuel consumption in diesels will be brought up to 155 or 162 g/hp per hour and of oil for waste, up to 0.3 or 0.4 percent of the fuel consumption.

Special attention is paid to the reliability of agricultural machines. The task of ensuring a trouble-free operation of equipment during the entire agrotechnical season has been set for developers and manufacturers. By the end of the 5-year period we plan to bring the time between complicated failures of plows up to 500 hours, of cultivators, up to 350 hours, of subsurface tillers, up to 280 hours, of grain seeders, up to 160 hours, of machines for mineral application, up to 450 hours, of sprayers, up to 120 hours, of Don grain harvesting combines, up to 300 hours, of potato and sugar beet harvesting combines, up to 200 or 300 hours, and so forth. By 1990 the share of machines produced for the first time will increase by 10 percent and

the share of products in the highest quality category, to almost 60 percent. All these and a number of other major technical and economic characteristics of the machines that will come off conveyers and will be put into production during the 12th Five-Year Plan are concentrated in the "Overall Program for the Development of Tractor and Agricultural Machine Building for 1986-1990" approved by the board of the Ministry of Tractor and Agricultural Machine Building.

This year we begin equipping series tractors and combines with electronic control means, including microprocessors. By 1990 a total of 65 percent of the produced tractors and 60 percent of the combines, seeders, and machines for mineral application will be equipped with them. The share of machinery and equipment fitted with microprocessor control means in the total volume of the sector's commodity output during the last year of the current five-year plan will comprise 25 percent (in 1985, a total 0.1 percent). In 1990 the calculated total national economic effect from the realization of the automation program will amount to 225 million rubles. A total of 160,000 tons of fuel will be saved, 57,000 machine operators will be released for other operations, and the number of failures of automated tractors will be reduced. A total of 175 automated machines and 32 tractors will be developed by 1990.

The envisaged retooling of agriculture will make it possible to bring the sector's power capacities up to 48 or 50 hp per worker and up to 470 or 490 hp per 100 hectares of arable land. Calculations show that by the end of the 12th Five-Year Plan, as a result of the utilization of new-generation machines, the period of fall plowing will be shortened from 25 to 18 days, of presowing cultivation, from 11 to 5 or 6 days, of grain crop sowing, from 5 or 6 to 3 or 4 days, and of cereal crop harvesting, from 24 to 7 or 8 days.

Scientists and designers persistently seek opportunities for reducing the specific pressure of the running part of equipment on arable and subsurface soil layers. In addition to work on lowering the total structural mass of machines there is a search, which is not unsuccessful, in the direction of improvement in engine designs. For example, increased-size tires are to be introduced for MTZ-80/82 tractors and the output of devices for doubling wheels has begun and different tire versions are being prepared for tests for the T-150K tractor. The caterpillar track width of T-150 and DT-175S Volgar tractors has been increased. Tires with a reduced air pressure are installed on Don-type combines, on Yenisey combines produced as of last year, on machines for fertilizer application, and so forth.

An expansion of the list and an increase in the volume of production of combined multioperating units performing several operations at one time is a very promising direction, which already gives perceptible results. For example, KA-3,6 and KFS-3,6 rotary sowing units in one operation cultivate soil before sowing, sow seeds, apply mineral fertilizers, and pack soil in sown rows. In addition to these machines, combined units for basic soil cultivation for winter crops, for presowing soil cultivation, for heavy soil cultivation, and for breaking up plant residues, wide-cut combined units for minimal soil cultivation, and a number of others are already being produced, or are undergoing acceptance tests.

Debates on the following question appear on pages of periodicals and scientific publications from time to time: What is more advantageous--the combine method of harvesting, or stationary threshing? It is unlikely that someone will be able to answer unambiguously. It is necessary to use both methods--in each specific case the method that will prove to be more acceptable and more advantageous than the other. As is well known, this depends on many factors. In any case, we will follow the path of further improvement in combines, because we do not consider the very near future of the combine method hopeless. At the same time, during this five-year plan the Ministry of Tractor and Agricultural Machine Building will complete the refinement of agrotechnical requirements and sets and parameters of machines for the application of stationary technologies and will begin the output of sets of technical facilities for harvesting grain crops and threshing them on a stationary unit.

The further improvement in all types of machines for agriculture is envisaged, that is, an increase in the working speeds and capacity of units and in the width of cut; combination and integration of operations; application of new materials, and so forth. The Ministry of Tractor and Agricultural Machine Building believes that it is within the sector's power to change over to a qualitatively new degree, which agricultural production needs, of equipping kolkhozes and sovkhoses with modern machinery, that is, to a complete development and a complete delivery of the entire set of machines required for the cultivation of a specific agricultural crop. However, this advanced, new approach to the formation of the machine and tractor pool ensuring an overall mechanization of production processes in rural areas is hampered owing to the lack of a comprehensive order with technological requirements of USSR Gosagroprom for sets of machines for the cultivation and harvesting of every crop.

The produced equipment will be more productive and universal, but also more complex, every year. This, in turn, will require ever higher vocational training of machine operators and their responsible attitude toward expensive machines. Unfortunately, there are still many facts attesting to the unsatisfactory operation of such equipment. About 40,000 tractors are annually written off before they reach the standard life, which is obviously understated, because about 80 percent of the parts of machines, which used it up fully and with the maximum load, can be utilized for further operation. The failure to keep maintenance schedules, poor-quality execution of maintenance, nonobservance of refueling and machine storage rules, and low quality of equipment repairs shorten the life and the time between failures and lower other technical and economic indicators incorporated in machines in design offices and plants and confirmed by tests at machine testing stations of USSR Gosagroprom. Thus, machine operators and machine builders (each with his methods) should fight together for the reliability, durability, and, consequently, high productivity of agricultural equipment. We, on our part, during 1986-1990 plan, in particular, to increase the production of parts hardened by methods of induction surfacing, surface-plastic deformation, chemical heat treatment, arc deposition, and laser treatment 10-fold. The volume of manufacture of welded structures on automatic and semiautomatic welding lines will increase 2.1-fold.



The months that have elapsed after the 27th CPSU Congress have shown that our sector's workers actively support restructuring ideas. These ideas have begun to be embodied in life. Many practical problems are solved more rapidly, with a big useful result. The sector as a whole copes with basic planned indicators. We must consolidate and develop these positive results, because as yet not everything has been done for a successful restructuring from the organizational aspect and economic levers and incentives, which should have a decisive effect on the acceleration process, do not operate at full force.

The 12th Five-Year Plan plays a special role in the realization of the economic strategy of production acceleration and intensification. Exceptionally complex tasks have been set for workers in tractor and agricultural machine building for this five-year plan. We will have to increase commodity output by 47.5 percent, by 1990 to bring the share of products produced during 3 years in the total volume of commodity output up to 30 percent, and to raise labor productivity by 45 percent. Capacities for the output of 308 types of machines in small series should be established at 44 enterprises. A total of 172 flexible production systems should be introduced basically at small-series sections.

An increase in labor productivity at every work place at plants, institutes, and design offices is of great importance for the accomplishment of the tasks set for the sector for the 12th Five-Year Plan. Labor collectives of production and scientific-production associations, enterprises, and organizations of the Ministry of Tractor and Agricultural Machine Building warmly responded to the appeal by the CPSU Central Committee to workers in the Soviet Union adopted by the June (1986) Plenum of the Central Committee of the party and to the decree of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU, and the Central Committee of the Komsomol "On the All-Union Socialist Competition for a Successful Fulfillment of the Assignments of the 12th Five-Year Plan." A search for resources and the creation of conditions for developing workers' initiative with a view to ensuring the planned increase in labor productivity, improvement in the quality of output, saving of resources, a strict observance of contractual obligations, and strengthening of labor discipline have expanded everywhere. Collectives of the following production associations are among the sector's right-flank collectives: the Minsk Tractor Plant imeni V. I. Lenin, whose output (Belarus tractors) is known on all continents, Rostselmash imeni Yu. V. Andropov, Lvovkhimselkhoz mash, Tselinogradselkhoz mash, and a number of others. Real prerequisites for solving problems concerning the mastering of highly productive, new agricultural machines and for ensuring their large-scale production in a short time have been created here. These collectives have found the most correct way to this--the introduction of new equipment and advanced technologies and improvement in labor organization and in the structure of management. The key to a successful and prescheduled fulfillment by the sector's workers of the tasks envisaged by the party concerning the replacement of the farmer's technical arsenal with sets of new-generation machines and implements of a high quality and technological level corresponding to the highest world achievements lies precisely here. The final result of their accomplishment is clearly formulated in the political report to the 27th CPSU Congress. It stresses that the agrarian sector needs

a decisive change in order to improve the population's food supply markedly during the 12th Five-Year Plan.

#### Criticism of Retooling Plans

Moscow TRAKTORY I SELKHOZMASHINY in Russian No 5, May 86 pp 1-5

[Article by A. A. Yezhevskiy, minister of tractor and agricultural machine building: "All Forces for the Fulfillment of the Decisions of the 27th CPSU Congress"]

[Text] Today the entire country and the entire Soviet nation live under the profound effect of the 27th Congress of the Communist Party of the Soviet Union. The highest forum of our homeland's party members has become an important historical landmark in the life of Soviet society and the new edition of the CPSU Program and Basic Directions in the Economic and Social Development of the USSR for 1986-1990 and for the Period Until the Year 2000 have consolidated the gearing of our economy toward accelerated intensification envisaged by the April and October (1985) Plenums of the CPSU Central Committee.

Workers in tractor and agricultural machine building unanimously approve the decisions of the 27th CPSU Congress and warmly support the internal and foreign policy of the Communist Party.

Now, when the tasks have been defined, it is time to embody the energy of intentions into the energy of actions. In every labor collective it is necessary to consolidate the high moral and spiritual tone set by the congress and the atmosphere of adherence to party principles, exactingness, Bolshevik truth, and a frank revelation and a decisive elimination of shortcomings and oversights created by it.

Speaking at a meeting with workers in the city of Tolyatti, Comrade M. S. Gorbachev stressed that creative labor, high organization and discipline, work with a full return at every section of the national economy by everyone without exception--workers, peasants, engineers, scientists, and people working in the sphere of management and in party, Soviet, and economic bodies--are the main conditions for embodying party plans and congress decisions.

Basic Directions in the Economic and Social Development of the USSR for 1986-1990 and for the Period Until the Year 2000 envisage the further strengthening of the material and technical base of agriculture and its transfer to an industrial basis. In the practical realization of this strategic direction in the entire internal policy of the party a significant role is assigned to tractor and agricultural machine building. Clear-cut tasks have been set for our sector, volumes of deliveries of equipment to the national economy have been established, and demands on its technical level have been determined.

During the 5-year period more than 2.5 million tractors are to be produced, out of which 1.65 million tractors and agricultural machinery and equipment worth no less than 20.3 billion rubles are to be delivered to agriculture, and

outfitting with sets of highly productive, efficient machines is to be improved. The manufacture of new models of caterpillar plowing, wheel-type universal row-crop, and powerful industrial tractors should be organized. The output of a set of implements for energy saturated tractors will be tripled, the development and output of highly productive combines for grain, potato, and vegetable harvesting, of a set of machines for two-phase harvesting of grain crops and stationary threshing, and of cotton harvesting machines will be ensured, and the production of self-propelled Step harvesters will be organized.

The most important task is to master the output of sets of highly productive machinery and equipment for soil protective farming systems and industrial and intensive technologies of agricultural crop cultivation and to increase the production of machines for the preparation and application of fertilizers to soil and for the treatment of plants with chemical protection agents. The development of machines with high technical and economic parameters meeting world standards will become the main direction during the 12th Five-Year Plan.

A little more than 3 years passed from the day of publication of the decree dated 4 April 1983 "On Measures for the Further Rise in the Technical Level and Quality of Machinery and Equipment for Agriculture, Improvement in Their Utilization, and Increase in Their Production and Deliveries During 1983-1990." During that time the sector ensured accelerated rates of development of highly productive equipment for rural areas. Designs of 310 types of new machines were developed, 137 were mastered, and 90 were delivered for series [production]. In 1985, as compared with 1980, the productivity of key types of equipment increased by 10 to 25 percent, specific material intensiveness was lowered by 6 to 10 percent, and reliability increased by 25 to 50 percent.

However, if we evaluate what has been done from the point of view of the requirements of the 27th CPSU Congress, we must admit that we have serious miscalculations in this work--it is done without the proper push and energy. A disruption in the development of 12 designs has been allowed and 38 types of machines have not been delivered for production. Recommendations for the manufacture of experimental batches of grain and rice harvesting rotor combines and devices for harvesting castor-oil plants have been received with a 1- or 2-year delay. A 2-year delay in formulating a decision on placing the SZ-4 hitchless seeder and the KLSH-15 wide-cut rod cultivator in production has been allowed. There is a 3-year delay in the development of a design of a tomato harvesting combine and in the output of the first industrial batches of the KTS-10-2 heavy cultivator for soil protective technologies and of the LDG-20 disk harrow. The formulation of a decision on placing a low-clearance self-propelled chassis for glass-covered ground in production was postponed from 1984 to 1986. It is planned to place the SMD-62 diesel for the T-150K tractor in production only this year instead of 1983. The production of a diesel for the DT-175S tractor was also postponed for a year.

This is primarily the fault of the State Special Design Office for Machines for Grain Crop Harvesting and Self-Propelled Chassis, the Kirovograd Planning and Design Institute for Soil Cultivating and Sowing Machines, the Moscow State Special Design Office for Machines for Vegetable Growing, the Odessa



State Special Design Office for Soil Cultivating Machines, and the Tselinograd State Special Design Office for Antierosion Equipment. The time of development of machines in these organizations often exceeds the standard time 1.4- to 2-fold. Tselinogradselmash, Krasnaya Zvezda, and Gruzselkhoz mash production associations disrupted assignments for mastering and organizing the series output of machines. These organizations alone did not deliver 26 types of new and modernized machines to rural areas during the past 5-year period.

Now, after the 27th party congress, such a situation cannot be tolerated. The lag must be eliminated this year. To fulfill the assignments of the decree dated 4 April 1983 of the CPSU Central Committee and the USSR Council of Ministers not at the end of 1990, but, for a number of the most important machines, a year earlier--this should be the response of workers in tractor and agricultural machine building to the decisions of this congress.

During the five-year plan we will have to increase the productivity of machines and machine and tractor units 1.5- to 2-fold, to lower the specific metal intensiveness of articles by 10 to 15 percent and the specific consumption of fuel and lubricants by tractors and combines by 10 to 12 percent, to bring the specific consumption of fuel by diesels up to 160 or 162 g/(hp-hour) and of oil for waste up to 0.3 or 0.4 percent of the fuel consumption, to prolong the life of tractors and engines to 10,000 or 12,000 motor hours, to double or triple the life of some machines, and to ensure a trouble-free operation of agricultural machines during the entire season.

During this 5-year period the sector's enterprises should master new-generation equipment, that is, the highly productive Don grain harvesting combine, the DT-175S Volgar power saturated caterpillar tractor, and the T-30/30A wheel-type tractor, which received a high rating at the 27th CPSU Congress, as well as new and modernized MTZ-100/102, MTZ-142, and T-70V tractors, SSh-28 self-propelled chassis, the ZhVR-10-03 wide-cut self-propelled harvester, the highly productive Step harvesting complex, the ZhRS-5 self-propelled rice harvester, the KP-3 potato harvesting combine, the SVK-3M grape harvesting combine, BMSH-15 and BMSH-20 hoe harrows, and a large number of new machines for power saturated tractors designed for chemical plant protection and industrial and intensive technologies. In productivity most of these technical facilities surpass the replaced analogs, which in combination with an increase in the number of machines should lower the need for workers in rural areas by more than 4 million during the 12th Five-Year Plan.

The ways of solving these problems are known. First of all, it is necessary to raise the efficiency of work of scientific research institutes, design offices, and planning-technological institutes. In order to accelerate the process of development of new machines three- or four-fold, it is necessary to equip institutes and design offices with testing stands and automation equipment. The number of stands will have to be increased, as a minimum, to 2,300. At the same time, however, the problem of efficiently utilizing stand equipment arises. After all, in 1985 the average stand loading coefficient, for example, in tractor building was only 0.39. It is also necessary to take every measure to introduce 113 systems for the automation of planning and design work during the 12th Five-Year Plan, which will make it possible to bring the level of their automation up to 25 percent by 1990.



The problem of coordinating scientific research should be singled out especially. Establishing scientific production associations and scientific and technical centers, we hoped to assemble all the aspects of a specific problem in each of them. But they operate in an uncoordinated way to this day. Institutes have their own plans, their pilot plants, their own, and designers, their own... As a result, only 139 out of the 550 new technological processes planned for 1983-1985 were developed in scientific production associations and only 120 were introduced into production. Following the example of the Tekhnolog Scientific Production Association we must more boldly change over to a unified planning and financing of these associations and to the introduction of general efficiency indicators.

The need to combine our scientists' efforts with those of scientists at corresponding institutes of USSR Gosagroprom was stressed more than once. For example, the All-Union Scientific Research Institute of Agricultural Machine Building imeni V. P. Goryachkin, the All-Union Scientific Research Institute of Mechanization of Agriculture, the All-Union Scientific Research Institute of Flax in Torzhk, and the special design office at the Bezhetskselmash Plant are now engaged in the development of machines for the mechanization of flax cultivation and processing, but the results are still very modest. There is a similar situation with machines for the cultivation, harvesting, and postharvest processing of potatoes.

An accelerated process of establishment of intersectorial scientific centers is going on in the country. We must adopt this idea and realize it rapidly, but thoughtfully from the organizational aspect. It is necessary to accelerate--jointly with USSR Gosagroprom--the establishment of goal-oriented scientific and technical collectives.

Often our scientists and designers, in response to rebukes about the low technical level of articles, try to put the blame on the client, saying: We have met his demands. This obsolete psychology must be changed. Only our sector and no one else is responsible for the correspondence of the specifications of Soviet tractors and agricultural machines to the highest world achievements! We should create, as well as advertise, our technical ideas and our designs if, of course, they take into consideration everything that is advanced in the area of machine building and agrotechnology.

The 27th CPSU Congress defined the acceleration of scientific and technical progress on the basis of the latest achievements of science and technology and the introduction of fundamentally new technologies and advanced equipment as the main direction in production intensification.

Volumes of manufacture of parts with the application of all types of reinforcing technologies should increase more than 11-fold in our sector during the current five-year plan. The number of articles treated by means of lasers will increase 12-fold and with thermogas, 10-fold. Volumes of thermochemical treatment will increase manyfold. In 1990 the production of precision billets by advanced metal saving methods of plastic metal deformation should rise to 36 percent and the manufacture of high-precision castings on automatic lines will increase 1.5-fold. It is envisaged

developing capacities and increasing the production of high-strength iron castings 5-fold and of metal powder articles 4.5-fold.

Vast opportunities lie in the introduction of advanced resource and power saving technologies in all production processes. Fundamental changes will have to be attained in this direction. After all, despite the fact that during the years of the 11th Five-Year Plan in their technical level the number of first-category enterprises increased from 22 to 46, more than 70 plants still operate with obsolete equipment and use yesterday's technology.

It is planned to deliver more than 930 automatic machining lines, 455 forging-pressing, casting, electric welding, and painting and 8,000 processing centers and numerical program-controlled machine tools, and other modern equipment to the sector during the new five-year plan. A total of 172 flexible production systems for all processes are to be introduced and the application of industrial robots in production is to be expanded 10-fold.

To ensure the preparation for the acceptance of this equipment and then its high efficiency during operation is not a simple task.

In his report at the congress Comrade N. I. Ryzhkov, chairman of the USSR Council of Ministers, quite rightly subjected the sector to criticism for an inefficient use of numerical program-controlled machine tools and other advanced equipment. The shift coefficient of such equipment is now extremely low--only 1.32. At Voronezhzhernomash, Altayselmash, Chirchikselmash, Davydovoselmash, and a number of other plants this coefficient does not exceed 0.8 to 1. Therefore, it is necessary to take the most decisive measures to introduce group processing methods and to provide software and service personnel for this equipment with a view to raising the utilization coefficient of numerical program-controlled machine tools to 1.9 during the new five-year plan.

The ministry will have to establish capacities for the output of 308 types of machines in small series at 44 enterprises. To this day, however, managers of the Kotelnikovo Agricultural Machine Building Plant, Davydovoselmash, and Voronezhzhernomash have not embarked on the establishment of shops and sections for "small series."

Special attention must be paid to tool production and to internal machine tool building. It is precisely these problems that today determine the greatest difficulties when new equipment is placed in production. In 1985 the sector failed to obtain a large number of tools and machining attachments. Capacities for their production are developed extremely slowly at the Bashselmash Plant, the Gryazi Cultivator Plant, and the Krasnoarmeyskselmash Plant. As before, despite the intensification in material incentives for tool production workers, the coefficient of utilization of equipment and capacities remains extremely low here--only 1.1.

An unsatisfactory situation with the development of internally produced equipment also remains. The assignment for commissioning capacities for internal machine tool building established for 1985 has been fulfilled only 85 percent and the coefficient of their utilization is 0.65.

Such a situation can no longer be tolerated. During the 12th Five-Year Plan we will have to increase tool production 2-fold and internal machine tool building 3.5-fold. Through internal machine tool building we will have to organize the production of advanced forging-pressing equipment, as well as to cover the shortage formed in the sector's provision with automatic machining lines. The organization of the output of rotor and rotor-conveyer lines acquires special importance. Whereas 33 such lines now operate in the sector, no less than 140 lines will have to be manufactured during the years of the five-year plan.

The time has come to evaluate the fulfillment of retooling plans not according to the number of introduced assignments, but according to the actual changes in economic efficiency indicators, that is, labor productivity growth, saving of material resources, rise in the quality of articles and output-capital, and number of certified work places. In this respect the experience of the following production associations deserves to be popularized widely: the Chelyabinsk Tractor Plant imeni V. I. Lenin, Plodselkhoz mash, and Kievtraktorodetal. For example, at the Chelyabinsk Tractor Plant imeni V. I. Lenin, as a result of the implementation of retooling plans, it is envisaged ensuring a significant growth of production volumes and of labor productivity, that is, 1.7-fold, prolonging the life of a tractor to 10,000 motor hours, and releasing 10,000 people for staffing new production facilities.

At the same time, retooling plans of the following production associations are noted for their low efficiency: Minsktraktoro zapchast, the Vladimir Tractor Plant imeni A. A. Zhdanov, and Lidselmash.

We should place retooling at the center of all our work. It is necessary to double or triple its rates and to ensure at every enterprise an annual replacement of no less than 10 or 12 percent of the equipment and an increase of up to 20 or 24 percent in the proportion of forging-pressing machines in the total pool of metalcutting equipment.

All the conditions necessary for the realization of this task have now been created. On 13 March of this year the CPSU Central Committee and the USSR Council of Ministers adopted a decree "On Additional Measures To Improve Capital Construction for the Purpose of Accelerating Scientific and Technical Progress in the Country's National Economy," which envisages measures to increase the interest of construction and installation organizations and other participants in construction in the performance of work on retooling and reconstructing existing production facilities and on further developing the economic method of construction. It opens up a wide field of activity for developing capacities and internal construction organizations, doubling or tripling rates and volumes of enterprise reconstruction, and expanding construction by the economic method.

As was noted in the political report of the CPSU Central Committee to the congress, the task of fundamentally improving the quality of output should become the concern of every Soviet person and of those who respect their labor and who are not indifferent to the honor of an enterprise, a sector, and our homeland.

Fundamental criticism directed at the Ministry of Tractor and Agricultural Machine Building for a low quality of agricultural equipment was heard in speeches by a number of delegates to the congress. Letters from rural machine operators also reasonably raise the following question: Is it possible that manufacturers of agricultural machinery do not know that increasing its reliability up to the standard time would bring a tremendous advantage and would make it possible to lower farm expenditures by approximately 2 billion rubles annually and to release about 300,000 workers?

A clear-cut production rhythm and strict technological discipline are the basis for a high quality. For the time being, however, many enterprises continue to turn out one-half of the monthly output during the third 10-day period. The removal of incomplete machines from conveyers has acquired a chronic nature. The removal of incomplete articles (despite the strictest prohibition) and rush work are the results of the lack of normed backlogs of subassemblies and parts, disruption in cooperated deliveries, low planning and production discipline, and decrease in the sense of responsibility of managers and specialists of a number of the ministry's enterprises, divisions, and administrations for the work entrusted to them. Nothing else can explain the low quality of T-330 tractors of the Cheboksary Industrial Tractor Plant, of A-01M and A-41 engines of the Altay Motor Construction Production Association, of hydraulic units of the Melitopol Tractor Hydraulic Unit Plant and of the Mosgidroprivod Plant, and of plows produced by the Odessapochvomash Production Association and the Altayselmash Plant. At these and a number of other enterprises managers' demands on executors for the quality of performed work have been lowered and there are serious shortcomings in the work of technical control divisions.

In connection with the fact that a significant number of manufactured machines are rejected by consumers owing to defects connected with accessories, materials, and semifinished products, the ministry adopted a decision to organize their strict receipt control before placing them in production, outfitting it with technological processes, measuring tools, and control instruments, staffing it, and allocating the appropriate areas. To this day, however, many enterprises have not fulfilled this demand. On the other hand, when the bodies of the State Committee for Standards apply fine sanctions, enterprise managers begin active work: They introduce receipt control, revise technical documents, and strengthen technical control divisions.

It is well known that the quality of the future article is born at a Kuhlman drafting unit. However, machines developed in collectives directed by V. Ye. Khorunzhenko, N. I. Cheban, G. P. Kuzmin, and V. M. Kalugin often "turned up" from state tests.

In accordance with the obligations adopted for the 12th Five-Year Plan we should raise the level of output in the highest quality category to 52 percent. To accomplish this task, it is necessary to utilize the entire set of organizational, economic, technical, and legal means and to mobilize the efforts of labor collectives and of every worker separately.



Today there can be no mention of production intensification without a fundamental change in the expenditure of raw materials, supplies, fuel, and electric power. For the five-year plan the ministry was given the assignment to lower the consumption of rolled ferrous metal products per million rubles of commodity output by 29 percent. In other words, 90 percent of the increase in the production of agricultural machinery should be ensured through efficiency. This requires a radical restructuring and a fundamentally new approach to the economy.

Thus, the introduction of the technology of manufacture of spline shafts, sprockets, and gear by cold and hot rolling methods is a promising direction in saving metal and in raising the productivity and quality of products. However, at Pavlodar and Altay tractor plants and at the Orel Gear Plant large-module gear teeth are machined according to obsolete technology--by the gear milling method. The introduction of hot gear teeth generation in full volumes would make it possible to save 5,800 tons of metal.

The party stresses the exceptional importance of the human factor in accelerating the rates of the country's social and economic development. Therefore, today it is so important to cultivate in every sector worker a keen sense of responsibility for the work entrusted to him and the awareness of the fact that all the benefits of society depend on the honest and selfless labor of everyone. Unfortunately, to this day some economic managers are captives of the dangerous error that production is their only concern and are not engaged in educational work in collectives.

Recently, the USSR Committee of People's Control checked the state of labor discipline at a number of the sector's enterprises. Serious shortcomings in educational work with personnel were uncovered in the course of the check. Cases of appearance of workers in a state of intoxication were noted at the Onega Tractor Plant, but these facts were concealed in shops. The number of unauthorized absences from work in Odessapochvomash and Kaztraktorodetal production associations and at the Kamyshin Forging and Casting Plant is high.

For the purpose of activating the role of the human factor we must utilize the sector's means of mass information and propaganda much more efficiently. Sixty-one newspapers in a single edition of almost 170,000 copies are published and 60 radio editorial boards with 100,000 listeners operate at enterprises. To fulfill party demands for expanding openness in work and for frequent and fuller reports by enterprise managers to workers, a decision on sending materials on the work of the ministry board and presentations of the most important orders to newspapers and radio editorial boards was adopted. The work of plant publications and the state of their material and technical base should be constantly in the field of vision of plant directors.

The tasks of labor collectives at the sector's enterprises and organizations set in the decisions of the 27th CPSU Congress and in the propositions and conclusions of the political report of the CPSU to the congress were examined at the expanded board of the Ministry of Tractor and Agricultural Machine Building held on 3 April 1986. The board approved measures for the fulfillment of congress decisions, as well as the overall program for the sector's economic and social development during the 12th Five-Year Plan.

The tasks facing the sector can and should be accomplished. We have the production, technical, and personnel potential, the experience in mobilizing labor collectives for the accomplishment of the most complex tasks, and the ardent desire of workers at all enterprises and organizations to appropriately respond to the party concern for a rise in the living standard of the Soviet people necessary for this.

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## FUELS

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### ROVENKI ANTHRACITE ASSOCIATION WORK DESCRIBED

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[Article by A. N. Mikheyev, deputy engineering director of the association: "Achievements and Prospects for Developing Rovenkiantratsit Association Mines"]

[Text] The Rovenkiantratsit [Rovenki Anthracite Production] Association was organized in August 1980. The mines are located in the Rovenki geological and industrial region, and the seams' bedding is complicated by a number of tectonic dislocations in the form of faults that split the panels across the strike. The wall rock of the coal seams is jointed, of average stability, and small in places. At each of the mines (except for the Underground Mine imeni Kosmonavty) two to four seams are being worked and, in all, 22 of the 36 mine seams have been prepared for working.

The underground mine inventory is represented by 13 operating units, which are combined into 7 administrative units, with a total annual production capacity of 7.74 million tons of coal. Underground Mines Nos 2 and 3 of the sh/u [Mine Administration] imeni Dzerzhinskiy were laid out in 1917, and they have reached a depth of 1,061 meters. Some of the mines were started in 1943 and 1955-1956. The workable reserves of the main seams have been worked down to a depth of 550-800 meters at the active mines. Only at the Underground Mines 23d syezda KPSS and Daryevskaya Nos 1 and 2 of the Main Administration Voroshilovskoye do average depths reach, respectively, 178 and 348 meters. Working conditions deteriorate with depth. Thus the wall rock temperature at the Underground Mines imeni Kosmonavty and imeni Dzerzhinskiy reaches 30 and 33 degrees C.

The association's mines are working primarily gently sloping seams, with dip angles of 1-20 degrees, while up to 1990 they will partially work seams inclined at angles of 26-30 degrees (the floors of the Underground Mines imeni Frunze and imeni Vakhrushev). The average dynamic thickness of the seams is 1.18 meters. Twelve percent of the workable reserves are in a zone of geological dislocation, and 50 percent of the seams lie in easily caving rocks, 20 percent of which have floors subject to heaving. Gasfree seams which are not dangerous in regard to explosiveness, rock bursts and spontaneous combustion are being worked. The strength of the country rock is  $f = 10-19$ . More than 28 percent of the workings in the main area (less than 18 km) pass through rocks with a strength of 8 or higher, while at the Mine imeni Vakhrushev 80 percent of the rocks have a strength of  $f = 10-19$ . The

mine floors were opened up and prepared with inclined shafts, and right now vertical shafts have been sunk at the Underground Mines imeni Frunze, imeni Vakhrushev and imeni Kosmonavty and No 71 of the Rovenkovskoye Mine Administration and No 2 of the Mine Administration imeni Dzerzhinskiy.

The region is promising in regard to the supply of explored reserves, and there are available sections where capital construction of the Underground Mines imeni Dzerzhinskiy, imeni 23d syezda KPSS, imeni Frunze, Voroshilovgradskaya No 2 and imeni Kosmonavty and the Voroshilovskoye Mine Administration is possible. Work is being done to cut out mine floors for the long term, using the reserves of these sections. Design institutes are readying feasibility, design and budget-estimating papers on working the reserves of the Underground Mines imeni Dzerzhinskiy, imeni 23d syezda KPSS and imeni Frunze. The development systems are of the shaft (60.5 percent, or 26 mine faces) and combined (39.5 percent) types. The coal will be excavated by KM-87, KMK-97, KMS-97 and KMK-98, KMT and Donbass longwall miners and by UST-2m, SN-75 and SO-75 breaking cutter-loaders and narrow-front cutter-loaders with separate metal supports.

The developmental workings are driven basically by the drilling and blasting method, with the use of PNB-2 and LPPN-5 rock loaders. At the Underground Mines imeni Frunze, imeni Bakhrushev and imeni Kosmonavty, 4PU driving cutter-loaders were introduced. Coal and rock transport over inclined workings is 61.2 percent conveyORIZED, 27.6 percent conveyORIZED over horizontal workings. During 1981-1985 the association greatly improved work organization, and production processes were mechanized and automated. By the end of 1985, 28 longwall miners operated at the mines and the level of mining by integrated mechanized mine faces (KMZ's) reached 77.4 percent versus 61.1 percent in 1980, but the daily workload fell from 836 to 566 tons. The level of mining by breaking cutter-loaders at this time increased from 9.3 to 17.4 percent, while the workload was falling from 404 to 364 tons per day. The reduction in workload was provoked by increase in the amount of coal mined at seams 0.6-0.7 meter thick and by the use of KMK-97 longwall miners which chop into 0.2-0.3 meter side walls with a daily workload of 350-500 tons.

Organizational and engineering measures called for by the "Comprehensive Plan for Ensuring Stable Work by the Association in Solving Production, Social and Education Tasks" and introduction of the achievements of science, technology and advanced experience enabled the work of many mines and associations as a whole to be improved and the goals for mining coal--39.2 million tons--to be met during the five-year period, as had been called for. During 1985 alone 341,600 tons of anthracite above the plan were delivered, productive capacity was mastered 102.4 percent, monthly labor productivity per mine worker was 45.4 tons (102.5 percent), the prime cost of producing 1 ton of coal was reduced 21 kopecks, and, as a result, more than 1.66 million rubles were saved and the plan for performing opening-up and developmental work was met.

The Underground Mines imeni 23d syezda KPSS and imeni Kosmonavty, the Rovenkovskoye and Voroshilovskoye mine administrations, 17 mining sections and 19 mining and 18 driving brigades coped with five-year plan tasks ahead of schedule. The 1985 plan was met ahead of time by 5 mines, 16 mining sections and 14 mining and 12 developmental brigades. Labor enthusiasm during the socialist competition to achieve high indicators as a worthy greeting



to the 27th Ukrainian Communist Party Congress, the 27th CPSU Congress, the 40th Anniversary of the Soviet People's Victory in the Great Patriotic War and the 50th Anniversary of the Stakhanovite movement aided the successes. Collectives of advanced brigades and sections were the initiators of this competition.

Most of the GROZ's [breakage-face mine workers] and drivers' collectives overfulfilled their commitments. Through the rational use of material, fuel and power resources, the association's workers worked for 3 days on materials and fuel that had been saved. Eight brigades achieved a daily workload per breakage face of 1,000 tons or more, and 7 are working at thin seams with a workload of 500 tons or higher.

Breakage-face mine workers' brigades supervised by Heroes of Socialist Labor G. I. Motsak (the imeni Kosmonavty mine) and N. N. Skrypnik (the imeni Frunze mine) and Honorable Miner I. T. Filev (imeni Vakhrushev mine) mined more than 500,000 tons of coal each per year. The GROZ brigades of UkSSR State Prize Winner A. I. Tkhor (imeni Frunze mine), I. A. Lopatko (Rovenkovskoye) and R. N. Shevchuk (Voroshilovskoye), and the driving brigades of USSR State Prize Winners A. A. Overchenko (imeni Frunze) and Yu. V. Kurbatov (Rostenkovskoye), and UkSSR State Prize Winners M. I. Feditskiy (imeni Kosmonavtovy) and A. B. Boyko (Voroshilovskoye) and others worked highly productively.

The association's workers' collective repeatedly emerged as the winner in socialist competition and was awarded challenge Red Banners of UkSSR Minugleprom [Ministry of Coal Industry] and the Ukrainian Republic Committee of the Trade Union of Coal-Industry Workers, the UkSSR Council of Ministers and Ukrsovprof [Ukrainian Trade-Union Council], and USSR Minugleprom and the Central Committee of the USSR's Trade Union of Coal-Industry Workers. According to 1985 work results and the 11th Five-Year Plan, the association was the winner in the All-Union socialist competition and was awarded the challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee.

The creative approach of workers, engineers and technicians to the use of blade machinery, the timely and high-quality preparation of entry floors with observance of the technology, precision in organizing labor and introduction of the advanced experience of the brigades of P. D. Preora of the imeni Lyutikov mine (Krasnodonugol) and I. A. Lopatko of the Rovenkovskoye Mine Administration, which are working at thin seams, and also the assistance of Shakhtniui [Shakhty Scientific-Research and Design Development Institute for Coal] staff workers, enabled more than 5 million tons of coal to be mined from breakage faces equipped with blade equipment. Breaking cutting-loaders have been operating in the association since 1975. Since 1981 the number of breaking cutter-loader longwalls has remained practically unchanged (7 in 1981, 9 in 1985), but coal-recovery volume, consisting of 1.27 million tons, rose 1.9-fold in 1985.

Working stably are the brigades of V. M. Zakharov at the imeni 23d syezda KPSS mine at a face equipped with the KMS-97 longwall miner with an SN-75 blade machine and I. A. Lopatko at a longwall with a KMS-97 longwall miner and a UST-2m blade machine (the average daily workload is 719 tons, while the maximum exceeded 1,130 tons) and of P. S. Vintsevich at the imeni Frunze mine at a longwall (the h<sub>11</sub> seam, which is 0.7 meter thick) equipped with a UST-2m installation and individual supports (the average daily workload is 602 tons, while the maximum is 721 tons).

Use of the UST-2m at the h7 seam of the Rovenkovskoye Mine Administration enabled a 1.7-fold reduction of idle time caused by falls, an increase in workload of 268 to 330 tons per longwall and an increase in the mined volume while maintaining the existing line of breakage faces at the former level of 1 to 1.2 million tons per year, and, after a long delay, stable operation in 1983-1985, which enabled the arrears to be repaid and the 11th Five-Year Plan to be completed ahead of time, on 31 October 1985. The fulfillment of tasks and measures for speeding up scientific and technical progress enabled the specific share of manual labor to be reduced by 1.9 percent, the prime cost of producing commodity output to be reduced by 6.1 million rubles, and 660 people to be released.

The plan for a rise in the engineering level during the 12th Five-Year Plan, in order to improve technical and economic indicators, called for an expansion in the introduction of new-generation longwall miners--the KMT, KM-103, KD-80, USV-2 and of the scientific and technical developments of the institutes IGD [Mining Institute] imeni Skochinsky, Donugi [Donetsk Scientific Research Institute for Coal], MGI [Moscow Mining Institute], KGMI [Kazakh Institute of Mining and Metallurgy], and others.

While intensifying production, in order to raise operating effectiveness the work experience of the branch's advanced collectives, which have achieved high indicators in the use of mining machinery and in introducing progressive ways for organizing and motivating the work, is being disseminated. With a view to studying advanced experience, trips by longwall-miner brigades to the industry's best enterprises and schools of advanced experience, based upon the brigades of G. I. Motsak and N. N. Skrypnik, A. A. Overchenko, A. I. Tkhor and M. I. Feditskiy, M. M. Yanovski and others, were organized.

As a result, high production indicators were achieved in the GROZ brigades headed by V. B. Sakharov (the imeni Kosmonavty mine), P. S. Vintsevich (the imeni Frunze mine), V. M. Zakharov (the imeni 23d syezda KPSS mine) and the development brigades of Yu. V. Kurbatov (Rovenkovskoye), V. V. Kolesnikov (the imeni 23d syezda KPSS mine), A. A. Boyko (Voroshilovskoye) and others. Characteristic for these brigades were high vocational skills and enthusiasm of the blue-collar workers; initiative and efficiency of brigade leaders and supervisors of shifts and section elements; effective use of machinery, which gives the greatest yield only with careful and wise upkeep; and engineering analysis and rational preparation of the workplace. Thus there is in G. I. Motsak's brigade full interchangeability, and the acceptance and turnover of shifts are made at workplaces. The lengthy assignment of workers to a definite type of equipment has helped all-round mastery thereof and the acquisition of technical-servicing and repair habits. Repair and preparatory operations are carried out during the first shift by a team manned by highly qualified workers who possess two or three allied trades. The machine-time factor was 0.4 or higher, and six strips of coal per day were won.

The introduction since November 1983 of the brigade contract is playing an important role in achieving high indicators. Wage-fund computation is determined to take account of the amounts of work and the coefficient of labor participation; its amount is 0.6-1.2. The brigade has a favorable social and psychological climate. The brigade's members are young (more than 80 percent of the workers are 20-40 years old), but they possess the

necessary reserve of vocational knowledge. Retired miners constantly transmit experience in organizing the work.

The brigade council, which consists of 30 miners under a brigade leader, has a special role in the collective's productive activity and social life. The council's functions include: the maintenance of a high level of labor and production discipline, indoctrination work, development of social competition, monitoring and management of mentorship, selection and assignment of personnel, and solution of the problems of material (by means of the KTU [labor participation factor]) and moral work incentives. During the five-year plan, all this enabled the brigade to mine about 2.88 million tons of coal--460,100 tons of it above the plan--and to bring the average daily workload per longwall up to 1,645 tons. G. I. Motsak organized two more brigades on the basis of his brigade--M. M. Yanovskiy's and V. B. Sakharov's--which achieved daily workloads of 1,000 tons. Now their experience is being copied and studied.

However, not yet has everything been done to make the mines operate rhythmically and to reduce the number of lagging collectives, to strengthen discipline and the state of organization, and to impose order at the enterprises. Three of the association's seven mines and 40 percent of the mining sections and just as many of the developmental sections have not been coping with the plan. Labor productivity has been allowed to fall, and questions of the development of enterprises are not being resolved to the proper extent.

More attention should be paid to the development and technical reequipping of the mine inventory. In the past decade, despite increases in the depth of the workings and in the mine-geology complications, capital investment for development and maintenance was reduced and was about 2.5 rubles per ton, and for some mines it has been cut down to 1 ruble. As a result, a substantial portion of the association's mines require rebuilding, technical analyses are becoming obsolete, reserves are being worked under temporary schemes, and many questions of transportation, ventilation and manhauling are not being solved.

Measures are now being taken to eliminate bottlenecks. During the 11th Five-Year Plan the association's enterprises assimilated 172.4 million rubles of capital investment, 67.4 million rubles of it for construction and installing work; and, at facilities for technical reequipping, 122.3 million rubles, or 70.9 percent of the total amount, were assimilated. Twenty-seven objects were put into operation, including two operating complexes for vertical shafts, three ventilation installations, a ventilation hole, ten new levels, new capacity at the Rovenkovskiy RMZ [Machinery-Repair Plant], and two storage facilities for 7,000 tons. In 1985 the plan for assimilating capital investment was fulfilled 104.9 percent. In-house investment of 5.6 million rubles, or 100.4 percent, has been assimilated.

An increasing gap between capacity introduced and capacity no longer in use is characteristic for the association, as it is also for the Donets Coal Basin. This is caused by a lack of provisioning of capital investment, the absence of the required construction base, and the slow pace of construction work. The lack of systematic centralized financing for developing the region's mines and the striving to maintain their capacity by involving more

productive coal seams in operation have led to the emergence of so-called temporary operating systems, which have been transformed into permanent systems.

All the association's mines, except the imeni Frunze, face the problem of erecting vertical shafts, since the conveyor lines (5-7 km long) have reached the limits of their operating reliability, and the length of the ventilation branches is 10 km. The network of workings being maintained at the various mines exceeds 100 km. The measures needed to increase the mines' capacity have not been taken in the last 15 years. During this period, only 244.53 million rubles of capital investment for maintaining the level of coal mined were assimilated, including 195.2 million rubles for construction and installing work. About 27.8 percent of the total volume thereof has been spent on reconstruction. During the 11th Five-Year Plan 167 million rubles of capital investment were assimilated. Construction by the in-house method increased 20 percent. During the 12th Five-Year Plan it is planned to increase this 1.3-fold, to bring it up to 30 million rubles. But even this is not enough.

The Rovenki coal region is promising in regard to fuel reserves. According to studies by Tsentrogiproshakht [All-Union Central State Institute for the Design and Feasibility Studies of Coal-Industry Development] and Voroshilovgradgiproshakht [Voroshilovgrad State Institute for the Design of Underground Coal Mines], 952.8 million rubles of capital investment, including 709.1 million rubles for construction and installing work, must be assimilated by the association's mines by the year 2000 if the level of coal mining reached is to be kept up. Mines of the Mine Administrations imeni Dzerzhinskiy, imeni 23d syezda KPSS and imeni Kosmonavty are to be rebuilt. Further technical reequipping of coal enterprises and modernization of auxiliary departments and services of the association are contemplated. It is planned to build 10 vertical holes with the surface buildings and structures, 5 large-diameter ventilation holes, 7 ventilator installations, four 110/35/6-kV substations, and other facilities.

The assistance of Voroshilovgradshakhtostroy [Voroshilovgrad Underground-Coal Mine Construction Combine] is needed for maintaining coal mining at the achieved level, since the association cannot, by its own efforts, provide for the necessary development of the enterprises. One of the most important reserves for raising capital-investment effectiveness is reduction in the time required for construction and rebuilding. However, each year the schedules are interrupted. For example, construction of the tower headframe for a vertical auxiliary shaft at the imeni Vakhrushev mine, which is a portion for the reconstruction operations, has been under way since 1982. The superior brigade of V. A. Pilipchuk (of Krasnodonshakhtostroy [Krasnodon Underground Coal Mine Construction Trust]) has experienced much idle time because of the lack of cement, sand and reinforcements. The deadline for putting the headframe into operation has repeatedly been moved and is now planned for 1986. The same situation exists also at the southern vertical downcast shaft at the imeni Frunze mine. Preparatory work has been under way since 1983, but it is anticipated that sinking of the shaft will not start until 1987. For a third year, construction of the road, the 6-kV electric-power transmission cable, and pipelines for drinking water and industrial water supplies has not been completed. All this threatens fulfillment of the measures planned for rebuilding and reequipping the association's enterprises.



The bases for production successes are further social development of the association and of the miners' settlements and the solution of Foodstuffs Program problems. There are more than 4,000 m<sup>2</sup> of greenhouses (eventually there will be 5,000 m<sup>2</sup>). Work is being done to improve, rebuild and develop the subsidiary livestock farm. The plan for social development for 1981-1985 called for supplying the workers with housing; since the start of the five-year plan, 66,000 m<sup>2</sup> of total housing space have been allocated to miners through shared participation in construction. Nine two-unit apartment houses have been built by in-house efforts, and the first phase of a health center for 200 spaces has been turned over. However, as before, the problem is still severe.

The comprehensive plan for supporting stable work by enterprises and for solving the most important production, social and education questions contemplates measures for improving workers' social and living conditions up to 1990: the construction of housing, a health center, polyclinics, a contagious-disease hospital, a kindergarten, schools and an interschool center for vocational orientation, a Pioneer camp, a consumer-services building, and so on. Nineteen million rubles are to be spent for these purposes. It is planned to increase construction by the in-house method. However, measures should also be taken to build up capacity of the production base of the combine's construction administration, Voroshilovgradzhilstroy [Voroshilovgrad Housing-Construction Administration].

Despite the difficulties, the miners are filled with resolve to carry out the tasks set by the party and to make a meritorious contribution to a strengthening of the country's might. Thanks to the acceleration of scientific and technical progress and the introduction of efficient equipment and technology, it is planned to raise the level of coal-mining mechanization by 13 percent during the 12th Five-Year Plan, bringing it up to 86 percent, to greatly reduce the share of manual labor, to increase productivity and to improve other technical and economic indicators of the Rovenkiantratsit Association's operations.

Measures have been developed for the radical improvement of the mines' work during 1986-1990 by accelerating technical reequipping and the use of internal reserves. It is planned to sink two vertical shafts (the imeni 23d syezda KPSS and imeni Frunze mines) and two ventilation holes (the imeni Frunze mine, to introduce into operation two ventilation installations (the imeni 23d syezda KPSS and imeni Frunze mines), and to build and put into operation five horizons and two operating longwall miners. The introduction of breaking cutter-loaders at small seams and use of the achievements of domestic and foreign technology and the scientific and technical developments of industrial and academic institutes (IGD imeni Skochinskiy, Donugi, ISM [Institute of Superhard Materials] of the UkSSR Academy of Sciences, and others) will continue. This will enable labor productivity to be raised 2.7 percent, the prime cost of producing commodity output to be reduced 9.8 million rubles and more than 2,700 m<sup>3</sup> of lumber and timber, 370 tons of ferrous and nonferrous metals and about 7 million kWh of electricity to be saved.

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## WORKING OF STANDING MINE PILLARS URGED

Kiev UGOL UKRAINY in Russian No 6, Jun 86 pp 20-21

[Article by Ye. V. Belyayev, candidate of engineering sciences (IGD [Mining Institute] imeni Skochinskiy): "Reactivation of Coal Reserves Is an Important Reserve of the Branch"]

[Text] The mining of coal underneath developed land and in areas affected by development work on shafts and permanent mine workings and by conservable water objects and other natural objects that are underground or on the surface is usually accompanied by protective coal pillars being left in place. The full gobbing used amounts to less than 5.6 million tons per year. The prime cost of producing coal depends upon the completeness of the extraction of useful minerals, since it includes amortization deductions from the mine's fixed capital. The less complete the extraction, the shorter the mine's service life and, consequently, the higher the amortization deductions. Coal losses in common mine pillars (protective and barrier) are 17 percent of the workable reserves in the Donbass [Donets Coal Basin], 37.7 percent in the Kuzbass [Kuznetsk Coal Basin], and 11.4 percent at Karaganda (table 1); on the average, for USSR Ministry of Coal Industry as a whole, it is about 6 percent of the economical reserves. The amount of mine rock sent to the surface in the regions examined reaches 62 million tons per year (table 2).

Table 1

Basin	Losses of coal in pillars			
	Under industrial facilities	Under cities or settlements	Under railroads	Under other objects
Donets...	2.5/2	8/6	6/1.5	0.5/0.5
Kuznetsk.	1.6/0	26.2/1	3.1/1	6.8/0
Karaganda	1.4/0.6	10/0.2	--	--

Comment: The numerator: losses (percent of workable reserves).

The denominator: mining from pillars (percent of total extraction at the mines).

The measures for preventing coal losses in common safety pillars are: constructional and engineering geology measures, post-subsidence repair of the facilities that have been underworked, gobbing (hydraulic, pneumatic and

Table 2

Регион (А)	З. п. млн. т (В)	D. млн. т (С)	Годовой объ- ем пород (млн. т) при технологии (D)	Тип объ- екта (G)	З. п. млн. т (H)	З. Г <sub>0</sub> млн. т (I)	З <sub>10</sub> млн. т (J)	З <sub>6</sub> млн. руб. (K)	(З <sub>1</sub> + З <sub>6</sub> ), млн. руб. (L)	МЗ. Г. млн. руб. (M)	З. млн. руб. (N)	(O) Меры охраны срезы N									
												1	2	3	4	5	6	7	8	9	
Восточный (Р)	1000	30	9	0	I	90	3	69	10	79	12	67	-	-	-	+	+	+	+	+	-
Донбасс					III	40	2	46	4	50	13	37	+	-	-	-	+	+	+	+	-
Донецко-Маке- евский район (Q)	1200	35	16	6	I	100	3	30	1	31	13	18	-	-	-	+	+	+	+	+	-
Донбасс					III	50	2	20	0,7	20,7	12	7	+	-	-	-	-	-	-	-	-
Западный Дон- басс (R)	1000	11	4	0	I, II, III	500	7	77	11,7	88,7	50	36	+	-	-	-	+	-	+	+	+
Красноармей- ский район (S)	1000	9	7	3	I	90	1	14	3,7	17,7	4,3	13	-	-	-	+	-	+	+	+	-
Донбасс					III	40	1	14	1,7	15,7	6,3	9	+	-	-	-	-	+	+	+	-
Центральный Донбасс (T)	500	17	12	8	I	40	1	12	6,3	18,3	3,3	15	-	-	-	+	-	-	+	+	-
Карагандинский бассейн (U)	1400	42	6	0	III	20	1	12	3,2	15,2	3,3	12	-	-	-	+	+	-	-	-	-
Проктопьевский район Кузбасса (V)	1200	20	5	0	I, II, III	500	13	225	30,6	255	95	160	+	-	-	-	-	+	-	-	-
Ленинский рай- он Кузбасса (W)	1000	23	3	0	I, II, III	150	2	18	6,7	24,7	12,6	12	-	+	-	-	-	-	+	+	-
					III	20	1	9	1	10,0	6	4	-	+	-	-	-	-	-	+	-
					III	80	1	9	3,7	12,7	6,3	6	-	+	-	-	-	-	+	+	-
					I, II, III	160	4	17,6	0,6	18,2	17,2	1	-	-	-	+	+	+	+	+	+

Notes:

Type of object:

- I. Buildings and structures on a ground surface.
- II. Water objects.
- III. Mine shafts.

Measures for protecting the environment:

1. Hardening pneumatic gobbing.
2. Hardening poured gobbing.
3. Hydraulic gobbing.
4. Pneumatic gobbing.
5. Freeflowing gobbing.
6. Compatible underworking which compensates for deformation of the rock mass.
7. Partial working throughout the area.
8. Constructional measures and repair.
9. Nature-conservation measures in regions susceptible to flooding.

[Key continued on next page]

Key to table 2.

- A. Region.
  - B. Workable reserves, millions of tons.
  - C. Mined, millions of tons.
  - D. Annual amount of rock (millions of tons), using:
    - E. Ordinary technologies;
    - F. Low-waste technologies.
  - G. Type of object.
  - H.  $\Delta_1$ --annual saving from overall increase in workable coal reserves with use of gobbing, millions of tons.
  - I.  $\Delta_2$ --annual saving from increase in workable reserves by reactivating new pillars, millions of tons.
  - J.  $\Delta_1$ --savings from making more rational (long-term) use of the mines' fixed capital, millions of tons.
  - K.  $\Delta_2$ --Savings from the increase in workable reserves, taking into account expenditures on protective measures, millions of rubles.
  - L.  $\Delta_1 + \Delta_2$ , millions of rubles.
  - M. M: Expenditures on measures for protecting underworked objects per ton of coal mined from the pillars, millions of rubles  
 $\Delta_3$ : [See key I, above].
  - N.  $\Delta$ --annual savings, millions or rubles.
  - O. Measures for protecting the environment N.
  - P. Eastern Donbass.
  - Q. Donetsk-Makeyevka region of the Donbass [Donets Coal Basin].
  - R. Western Donbass.
  - S. Krasnoarmeyskiy region of the Donbass.
  - T. Central Donbass.
  - U. Karaganda Coal Basin.
  - V. Prokopyevskiy region of the Kuzbass [Kuznetsk Coal Basin].
  - W. Leninsk region of the Kuzbass.
- 

freeflowing, and partial excavation of workings by working short breakage faces, leaving interlongwall or interroom pillars behind. These measures are used in extremely limited amounts and only under favorable mine-geology conditions.

In the Kuzbass and at Karaganda, winnings from pillars are, respectively, 2 and 0.8 percent of total mining at the underground mines, although the reserves in the pillars reach 37.7 and 11.4 percent of the workable reserves. In the Donbass, the working of pillars is going on more intensively (10 percent of total mining for the basin, where the mothballed reserves are 17 percent of the workable reserves). About 3 percent of the economical reserves that have been mothballed are in shaft-protecting pillars and are lost irretrievably. The mining of common mine pillars with rock gobbing is done only in the Central Donbass at the Krasnyy Oktyabr mine, in an amount of up to 0.3-0.5 million tons of coal per year, using less than 1 million tons of rock per year.

Common mine pillars for protecting shafts and permanent workings and buildings, structures and natural objects on the surface cannot be left in most cases. The panels of the seams within the area affected by objects that are to be preserved must be mined by the use of gobbing and of mining, constructional, engineering-geology and agroindustrial measures that do not entail abandoning the coal in the ground. Gobbing with mined rock should be used



more widely, including hardening gobbing and compatible underworking. In the Donbass (Eastern, Western and Central, and the Donetsk-Makeyevka and Krasnoarmeyskiy regions), the Kuzbass (the Prokopyevsk-Kiselevsk and Leninsk regions), and the Karaganda Coal Basin (the industrial section in Karaganda), it is proposed to reactivate 1.8 billion tons of economically mined coal reserves and to provide for mining pillars in the amount of 44 million tons per year, including those from the enumerated coal-mining regions, respectively: 5, 7, 2, 5, 2, 4, 4 and 15 million tons per year. For gobbing (pneumatic hardening or poured, pneumatic, hydraulic and self-flowing gobbing) mine rocks, waste from the coal-preparation process, burnt-out rocks from the dumps, and granulated slag must be used as the filler, and finely ground dump rocks and finely ground slag from blast and open-hearth furnace pourings, must be used as the binder.

The loss of coal in common mine pillars, in using measures to preserve objects, can be cut to one-third of the existing level. Forty-five million tons of rocks can be used per year for gobbing worked space. Conversion to a pillarfree technology in the vicinities of objects to be preserved will enable the indicators of rational use of underground space to be greatly improved. Deformation of the ground surface is reduced 2-fold to 5-fold by the continuous working (without pillars) of seams with gobbled mine rock, the geomechanical, hydrogeological and engineering-geology conditions of the undercut developments and lands becomes more favorable, and the land area of the dumps is reduced. The planned coefficients of coal-extraction completeness (not taking other sources of losses into account) in the areas being preserved will be 96 percent in the Donbass, 94 percent in the Kuzbass and 98 percent in Karaganda.

The economic benefit expected from introducing measures for protecting surface objects can be determined by the VNIMI [All-Union Scientific-Research Institute for Mine Surveying] methodology as the saving (annual) through the more rational (longer) use of the mines' fixed capital  $\Delta_1$  and the benefit  $\Delta_2$  from increase in industrial reserves, taking into account the expenditures for protection measures:

$$\Delta = \Delta_1 + \Delta_2 - MZ_r = Z_r(z - c + a) + aZ_A D / (Z_n + Z_A) - MZ_r, \quad (1)$$

where M are the expenditures on measures for protecting overlying ground objects per ton of mining from a pillar, rubles;

$Z_r$  is the annual increase in workable reserves by reactivating new pillars, millions of tons;

z are the standard maximum expenditures per 1 ton of coal, rubles;

c is the full prime cost for producing 1 ton of coal, rubles;

a are the specific capital expenditures per 1 ton of workable reserves, rubles;

$Z_A$  is the total annual growth of workable coal reserves by working with gobbing, millions of tons;

D is the annual mining of coal by region (or rayon), millions of tons; and

$Z_n$  are the workable coal reserves for the region (or rayon), millions of tons.

Calculations made under formula (1) indicated that the expected annual economic benefit is about 400 million rubles, thanks to the reactivation of 1.8

billion tons of economically mined coal reserves and to an annual liquidation thereof of 44 million tons in the Donbass, the Kuzbass and the Karaganda Coal Basins. This benefit is made up of the 510 million rubles from the increase in workable reserves and 57 million rubles from the longer use of fixed capital, less 225 million rubles for protection measures. The main expenditures are for the hardened and other types of gobbing in the amount of 25 million m<sup>3</sup> per year, at a cost of 234 million rubles, for constructional, engineering-geology and precautionary measures, and for repair of the protected surface objects, at a cost of 21 million rubles.

In order to obtain the coal industry benefit, the expenditures for protection should not be included in the prime cost for producing the output but should go for budget appropriations for environmental protection. If this is not done, then the industry will not be motivated economically toward reactivating the reserves or toward using such labor-intensive measures as gobbing space that has been worked. The economic benefit  $\mathfrak{B}_3$  from reducing expenditures for storing waste is determined by the formula of VNIIOsugol [All-Union Scientific Research and Design-Development Institute in the Coal Industry for Protecting the Natural Environment]:

$$\mathfrak{B}_3 = (Q_1 - Q_2)(C_0 + \mathfrak{B}_x), \quad (2)$$

where  $Q_1$  and  $Q_2$  are the amounts of rock placed in the dump under, respectively, the basic and the new technologies, millions of tons per year;

$C_0$  are the expenditures for storing 1 ton, rubles;

$\mathfrak{B}_x = \mathfrak{B}_x + EK$  are the adjusted expenditures for storing 1 ton, rubles;

$\mathfrak{B}_x$  and  $K$  are the current and capital costs for storing 1 ton of rock, rubles; and

$E$  is the standard coefficient for capital-investment effectiveness.

For the Donets, Kuznetsk and Karaganda coal basins,  $\mathfrak{B}_3 = 64.2$  million rubles. The total expected economic benefit from reactivating the common mine pillars and leaving rock in the mines is about 460 million rubles per year.

The use of gobbing will improve the status of the workings, cut their length and increase work safety. The level of completeness of coal extraction and specific measures for protecting the region are substantiated by a technological simulation of mines made by IGD imeni Skochinskiy. The amounts of the reserves in the shaft-protecting pillars are estimated roughly in accordance with the data of VNIMI, IGD imeni Skochinskiy and Kuzniki [Kuznetsk Scientific-Research Institute for Coal] by the equation:

$$\mathfrak{B}_u = \mathfrak{B}_n / K_c K_n / 100, \quad (3)$$

where  $\mathfrak{B}_u$  are the reserves in the shaft-protecting pillars, millions of tons;

$\mathfrak{B}_n$  are the workable reserves, millions of tons;

$\Pi$  are the workable reserves in the common mine protective pillars, in percent of the economically minable reserves;

$K_c = 0.45$  is the share of the shaft-protecting pillars in the overall mine protective pillars; and

$K_n = 0.5$  is the coefficient of completeness of the removal of the shaft-protecting pillars where they are partially worked, with gobbing.

The annual amount of growth of industrial reserves from the pillars will be found from the formula  $3_r = 3_{\pi D} / 3_n$ , assuming liquidation of the reserves uniformly in time for the mine's whole service life. Adjusted expenditures  $z$  were determined in most cases by multiplying the price of realizing 1 ton of coal in the region by the coefficient 1.25. For the Eastern and Central Donbass and the Kuzbass's Leninsk region, the average prime cost of producing the coal at eight mines with the highest prime production costs is adopted as the value of  $z$ . The values of  $c$ ,  $a$  and  $D$  are taken from TsNIEIugol [Central Scientific-Research Institute for the Economics of and Scientific and Technical Information About the Coal Industry] data.

The specific cost (per 1 ton of mining from a pillar) of protective measures for hardening gobbing was 6 rubles, but less than 3 rubles for freeflowing and hydraulic gobbing and less than 4 rubles for pneumatic gobbing, but, taking into account constructional measures and post-subsidence repair, less than 0.3 ruble. Compatible underworking and the partial excavation of pillars for the area of a seam do not require additional expenditures over those of the traditional technology. The cost of nature-conservation measures in the Western Donbass regions subject to flooding, in the amount of 170 million rubles for 20 years, was taken from Dneprogiproshakhta [Dnepropetrovsk State Institute for the Design of Underground Coal Mines] data.

Realization of the solutions proposed will enable the amount of reserves opened up and prepared for working at existing mines to be increased, the necessity for large capital investment for finding new horizons to be precluded in some cases, and the amount of rock sent to the surface to be sharply reduced.

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## FUELS

UDC 622.232:622.274 "sh. im. Bazhanov"

### UKRAINIAN MINE REPORTS ON EQUIPPING CHANGES

Kiev UGOL UKRAINY in Russian No 6, Jun 86 pp 5-9

[Article by A. D. Solyarov, director of the Underground Mine imeni Bazhanov: "Technical Reequipping at the Underground Mine imeni Bazhanov"; capitalized passage printed in boldface]

[Text] The Underground Mine imeni Bazhanov of the Makeyevugol [Makeyevka Coal Mining Association] is a highly mechanized Donbass [Donets Coal Basin] coal enterprise. It was built in accordance with a design by Yuzhgiproshakht [State Design Institute for the Design of Coal Mines and Coal Preparation Plants in the Southern Economic Region]; phase 1 was turned over in 1957 with a design capacity of 400,000 tons per year, the second phase in 1964 with a capacity of 800,000 tons. An annual productive capacity of 1.47 million tons has now been established. The first phase is working the  $h^H_1$  seam (0.8-0.9 meter thick) at a depth of 588 meters; it has been assigned to the supercategory in regard to gas, methane is present at 20 m<sup>3</sup>/ton, and the seam is dangerous in regard to bleeder emissions. The mine's second phase is working the  $m_3$  seam (1.5-1.65 meters thick) at a depth of 1,140 meters, which is assessed as dangerous in regard to sudden outbursts, and methane is present at 56 m<sup>3</sup>/ton.

The enterprise, one of the first in the Soviet Union, began the working of seams at a depth of more than 1,000 meters, which were complicated by mine-geology conditions (great mine pressure, intense heaving of the floor rock, a high temperature, and dangerous in regard to outbursts of the seam). Therefore, in the first days of its existence, the mine became a general laboratory for many scientific-research institutes. The mine floor was opened up by six vertical shafts. It was readied under horizontal and stored schemes. The systems for development were of the continuous, combined and shaft type. The immediate roof of the  $h^H_1$  seam was slate of average stability (strength of 4-6); the floor was stable slate (4-6). The  $m_3$  roof seam was clayey slate and unstable (strength of 4); the floor was stable sandy slate (4-6). The country rock's temperature was 38-45 degrees. The seam's angle of dip was 5-6 degrees.

Working is performed from the shafts to the mine floor limits. In so doing, the length of the workings that are kept up increases, the conveyor line is lengthened, the number of machines and mechanisms is increased and, consequently, so is worker manning. Fulfillment of the mining plan is provided



for by seven comprehensively mechanized breakage faces. The average labor productivity per mine worker is 41.7 tons per month.

The mine's first phase operates under very complicated conditions--an inadequacy of air for aeration, a five-stage scheme for sending out the rock and the execution of auxiliary operations, an excessive time stated in the Safety Rules for delivering people to workplaces, a multiple-stage scheme for water removal, and so on. Three breakage faces equipped with KM-97D longwall miners are constantly in operation. Two-cutter loader winning of the coal is introduced, which precludes preparation of recesses at the end sections.

For the first time, provision was made at the mine for longwall miners to make U-turns without making a development working or performing disassembling and assembling operations. During the 11th Five-Year Plan such provisions were made at three longwalls.

At the start, workings of the mine's first phase were advanced by means of drilling and blasting. In 1982 the chief of panel No 6, V. M. Chinenov, proposed that an airway be made behind the longwall by the PK-3r cutter-loader. Since the PK-3r is intended for rocks of strength less than 4 and the strength here was as much as 6, the panel's innovators reinforced the operating implement, they changed certain cutter-loader components, and the airway was introduced successfully.

At present, all the workings are being worked by GPK and 4PP-2 cutter-loaders. In order to reduce the amount of rock sent to the surface, at the mine's first phase it was decided to produce two permanent inclines in pairs. A longwall 75 meters long, equipped with MK-97 mechanized mine support, a 1K-101 cutter-loader and an SP-63 conveyor, was developed between them. GPK cutter-loaders made the inclines, and a Titan-1 gobbing complex sent the rock to the longwall's excavated space (figure 1). Such a technology allowed the rock to be left in the mine and enabled stable ventilation of two workings and an incidental mining of coal.

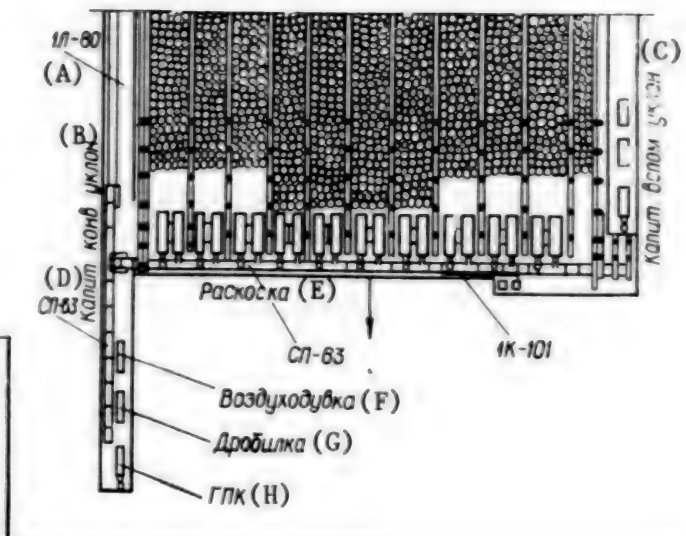
The use of mobile compressor installations has enabled jackhammers to be used when driving split cut-throughs. For normalization of the gas environment at the panels, a temporary vacuum-pump station was built, by means of which the overlying associated rocks and country rock were degassed.

Conveyors delivered coal from the breakage faces directly into the skip shaft bin. The conveyor line is 6 km long. At the start of the 11th Five-Year Plan, 14 KLA-250 belt conveyors were laid over inclines totaling 4.5 km in length. Prolonged operation of them led to substantial idle time for the mining panels because of accidents. The collective has been assigned the task of reducing the number of conveyors to a minimum by replacing the existing ones with ones of greater capacity. The collective of the conveyor-transport section, supervised by A. S. Zhukov and mechanical engineer Yu. M. Levichev, coped successfully with this task, and innovators extended great assistance. The number of conveyors was reduced to 11. The 1LU-100, 1LT-100 and 1L100u were introduced.

In the mine's second phase, there are four longwall-miner equipped breakage faces. The average daily workload per longwall in 1985 was 844 tons. All

Figure 1. Scheme for Capital Workings That Have Been Driven.

- A. 1L-80.
- B. Permanent belt incline.
- C. Permanent auxiliary incline.
- D. SP-63.
- E. Utility space.
- F. Blower.
- G. Crusher.
- H. GPK.



the mine faces were equipped with KM-87e longwall miners, which included the SPM-87 conveyor, the 2K52 cutter-loader and M-87e mechanized supports.

Then KM-87um<sup>n</sup> and KM-ump longwall miners were used. Since 1982 the IGSh-68 cutter-loaders, which enabled the recesses to be shortened and manual labor to be cut, were introduced at the longwalls. It is planned to convert to the more modern RKU-10 cutter-loaders during the 12th Five-Year Plan.

Workings are driven by GPK and 4PP-2 cutter-loaders. The VMTs-8 and VMTsG-7 were used for ventilating mine-face deadends.

The mine began the development and working of panels, where the m<sub>3</sub> seam is assessed as especially dangerous in regard to sudden outbursts of coal and gas. Because of the increasing frequency of outbursts, the pace of driving workings has been sharply reduced, and the timely preparation of new longwalls has been interrupted. Therefore, it was proposed TO DRIVE THE MAJOR PORTION OF THE WORKINGS, WHILE DEVELOPING A REMOVAL SECTION, INTO THE UNLOADING ZONES, ALONG AN EXCAVATED SPACE OR A SPACE CHOPPED INTO IT. AS A RESULT, THE SPEED OF DRIVING WAS INCREASED, THE REPAIRFREE TIME FOR UPKEEP OF THE WORKINGS HAS RISEN GREATLY, AND LABOR CONDITIONS HAVE IMPROVED. Right now a 1,100-meter horizon is being prepared. All the permanent workings here are driven along mined-out space and have not required repair for about four years. In 1985 alone the economic benefit from introducing this method of making workings exceeded 95,000 rubles.

In 1982 the 4PP-2shch cutter-loader, which permits drifting along a seam with an outburst hazard to be performed without the use of antioutburst measures, was tested at the mine. The final touches are now being put on the machine.

During operation of the M-87 supports at longwalls along the strike, much time was consumed in aligning the sections, since, during shifting, they were tilted in the direction of the seam's dip. The mine's innovators proposed to increase the area of the section's base, which enabled the elimination of supplemental work on the longwall. At section No 5, the telescoping Gvarek-1000 belt conveyor was introduced in an entry, and the economic benefit was 10,000 rubles. In order to reduce the labor intensiveness of the work of repairing workings, a track-settling machine was introduced. The tensioning head of the Gvarek-1000 conveyor and the SP-202 flight

conveyor moved in unison. A number of innovators' suggestions, which increased labor productivity and the pace of coal mining, were introduced.

Since 1984 polyurethane compositions have been injected into roof rocks to strengthen them. This technology enabled the quality of the coal mined to be improved and the workload per longwall to be increased. The innovators designed injection installations that are being used successfully to strengthen the rock at the brows of the longwalls and within the longwalls at panel No 7. The Nagus-212 injection installation has passed its test and the Nagus-225 is undergoing test. The economic benefit from introducing the technology for strengthening roof rock was 109,000 rubles in 1984, 68,000 rubles in 1985. The driving of excavations in the discharging zone about the space being worked has enabled reinforced concrete, as well as metal network, to be used, instead of wooden lagging. On the average, 0.13 m<sup>3</sup> of the timber material is saved in performing 1 meter of driving. Instead of the board chocks previously used in lagging for longwalls, belts made of reinforced-concrete blocks have begun to be used in the working seam h<sub>1</sub><sup>H</sup>. The saving in lumber and timber materials per 1 meter of advance of the breakage face is 0.8 m<sup>3</sup>.

In 1982 a stationary refrigerating installation with a productivity of 6.8 million gigacalories/hr, which improves temperature conditions, was turned over for operation. KPSH-90 mobile refrigerating units are being used widely. Two vacuum-pump stations for degassing underlying and overlying associated and the enclosing country rock of the m<sub>3</sub> seam are operating. One of the boilers in the boilerhouse is working on gas that is pumped by these stations, and another has been reequipped for burning coal in a fluidized bed, enabling reduction in expenditures on solid fuel for in-house needs and in the discharge of harmful substances into the atmosphere.

More than 16 km of workings are driven each year, under a plan for 15.3 km. The level for cutter-loader driving is 81 percent and for conveyorization of coal and rock it is 41.6 percent for inclined workings, 28 percent for horizontal ones. The conveyorization of coal over inclined workings and the level of extraction from longwall-miner mechanization of breakage fronts have reached 100 percent.

The mine was awarded the first monetary prize for the results of the republic's socialist competition for the collectives of enterprises, organizations, panels and brigades during the second quarter of 1981 and the fourth quarter of 1984. It has become traditional to establish records before significant dates. Thus, in 1983 V. P. Levitskiy's brigade mined 1,320 tons of coal per day at a seam 0.8 meters thick under a plan for 570 tons, in 1984 V. S. Drozdov's brigade sent out from panel No 5 2,730 tons of coal under a plan for 1,005 tons, and in 1985 this same collective brought the record up to 3,100 tons per day under a plan for 1,250 tons and, in honor of the 27th CPSU Congress, up to 3,220 tons.

Mine panel No 5 is achieving high technical and economic indicators under the young engineer Communist L. F. Trunov. More than 122,000 tons of high-quality coal were mined above the plan here in 1985. The new collective is striving to introduce into the section everything that is advanced.

Among the drifting brigades, the best results were obtained by the collectives supervised by G. S. Nesterenko, L. N. Zuyev and L. L. Tarasov. Thus, during the 11th Five-Year Plan, G. S. Nesterenko's brigade made almost 6 km of mine workings under a plan for 5,238 meters, and the 1985 task was fulfilled 119.8 percent. L. N. Zuyev's brigade made about 5.8 km under a plan for 5,411 meters and fulfilled the task by 109.9 percent.

The collective of drifters supervised by L. L. Tarasov should be specially noted. The brigade has 45 people. The five-year plan was met ahead of time--on 24 July 1985, it made about 7.2 km of workings--683 meters of it above the plan, the 1985 goal was met 112.3 percent, and the average pace for drifting for a month was 110 meters. The brigade undertook a commitment to drive 100 meters of workings above the plan in 1986. During the first quarter it drove 530 meters of workings under a plan for 477 meters.

Despite the fact that the enterprise is one of the highly mechanized ones in the coal industry, the share of manual labor still is substantial. In order to reduce the share thereof, a brigade for introducing small-scale mechanized equipment has been created. It is manned by experienced miners who have dozens of innovators' suggestions to their credit. Supervision of the brigade has been assigned to Distinguished UkSSR Innovator V. V. Yashchuk.

The brigade's main task is the manufacture and introduction into the industry of suggestions submitted by the mine's workers. During 2.5 years, more than 100 units of equipment and attachments were developed and introduced. Most effective were the following: an installation for injecting solutions that fix unstable rocks (the installation has interested a number of the country's mines); seals that are to be used many times; a machine for making staples for fastening the ends of belts; a press for cutting scrap metal; shears for dressing wood directly at workplaces in the mine; a device for attaching the drive heads of longwall conveyors, with simultaneous adjustment of the gaps between the drive and the gate conveyor.

The introduction of new equipment and technology requires a systematic rise in the level of knowledge of tending personnel. So each year engineers and technicians are busy at institutes for raising qualifications, blue-collar workers at training centers and combines. In 1985, 41 engineers and technicians and 1,350 blue-collar workers finished courses at the indicated training institutions.

The council of the mining NTO [Scientific and Technical Society] plays a major role in meeting the state plan and in engineering creativity. The primary NTGO [Scientific and Technical Mining Society] organization at the mine numbers 852 people. Three sections work under the primary organization: mining, work safety, and the economics and organization of production, plus two offices--for economic analysis and for technical information. It is the practice to hold joint sessions of the mining NTO council and the mine's engineering council. Leading specialists of the enterprise are invited for the sessions, depending upon the matter being examined, plus the chiefs of panels and the supervisors of the services. Each quarter the results of the competition for personal creative plans for engineers and technicians are summed up, and the titles of the best mining and the best mine engineer are awarded.



For the timely study of informational materials, there is at the mine a group of 15 consultants. Arriving information is studied and the place for implementing it is selected. Leaders of the panels where it will be introduced are familiarized with the contemplated innovations. Thus, on the recommendation of the consultants' group, the experience of A. I. Lyashko's brigade from the Underground Mine imeni Stakhanov of the Krasnoarmeyskugol Association was used in V. S. Drozdov's GROZ [breakage-face mine workers] brigade, as a result of which labor productivity grew 118 tons/month under a plan for 35.3 tons. The 1985 plan was carried out on 14 October, about 93,000 tons of coal were produced above the plan, and the average daily workload per longwall was 1,230 tons. A. N. Kulbachko's GROZ brigade introduced the work experience of A. I. Yaroshenko's brigade from the Yasinovskoye Mine Administration of the Sovetskugol Association, increasing the workload per longwall of a seam less than 1.2 meters thick. Labor productivity grew by 23.8 tons/month under a plan for 17.1 tons.

The council for preventive measures was assigned a considerable role in strengthening work, production and technological discipline. The supervisors of panels and departments, the chairman of the trade-union committee, the mine's party-committee secretary and the Komsomol committee secretary are invited to its sessions. Each time, the work of one of the panels is discussed in relation to observance of the work-safety rules. Violators of the safety rules and of social order are discussed. A factor of no little importance in strengthening performance discipline is distribution of the wage fund among members of the brigade in accordance with the labor-participation factor. In establishing the factor, the amount of work done, its quality and the observance of work safety and labor discipline are considered.

Special attention is being paid to socialist competition. It embraces the collectives of all the panels, brigades and teams and engineers and technicians. Progress in carrying out the adopted commitments are monitored by the mine's management and by the party, trade-union and Komsomol organizations. The results of the competition are summed up at a meeting of the trade-union committee jointly with the management. In distributing the standings, consideration is given not only to the quantitative indicators but also to discipline, quality of the work done, and participation in social life. Banners and pennants are handed out at shift-worker meetings. The results of the competition are publicized each month in the widely distributed newspaper SHAKHTERSKAYA ZHIZN [Miner's Life], daily successes in the MOLNIYA [lightning] leaflet, which is posted in the common cloakroom.

A festive reception is organized at the mine when a record is set and meetings are conducted when a panel or brigade fulfills ahead of schedule the plan for the year or the five-year plan period. Improvement of the motivation and incentives for advanced workers in the competition helps to increase exactingness, the state of organization, and a creative attitude toward the job.

The mine's collective carried out the 11th Five-Year Plan for mining on 16 August 1985 and produced 630,000 tons of coal above the plan, while the 1985 plan was met 6 December and 122,000 tons of coal were produced above the plan for the year. Innovators made a great contribution to the prescheduled fulfillment of the plans for mining coal and for reducing prime production costs. During the five-year plan, 2,234 suggestions were submitted

with a tentative economic benefit of more than 2 million rubles. The proposal submitted by Chief Mechanical Engineer N. G. Kortel and senior mechanical engineer G. A. Zubarevich, who recommended sending air into the mine over one of the pipelines laid along the ventilation hole instead of the old airway at shaft No 1, was recognized as the best one. The economic benefit from introducing this suggestion was 258,000 rubles.

Creative collaboration with Donugi [Donetsk Scientific-Research Institute for Coal], Dongiproshakht [Donetsk Institute for the Design of Coal Mines and Coal Preparation Plants], IGD [Mining Institute] imeni Skochinskiy, DPI [Donetsk Polytechnical Institute], Maknii [Makeyevka Scientific-Research Institute for Work Safety in the Mining Industry], VNIIGD [All-Union Scientific-Research Institute for Mine Rescue Affairs], and so on helped in the enterprise's stable operation. Because of the complicated mine-geology, measures approved by USSR Minugleprom [Ministry of Coal Industry] planned that the mine will be the base for Maknii and the VNPO [All-Union Science and Production Association] Respirator in the introduction of their developments in the area of the improvement of ventilation, protection against dust gas, the degassing of seams, fire protection, life-support systems and means during underground accidents, and reduction of the temperature in the workings.

Master schemes for laying out the mine floor call for a great amount of reequipping work during the 1986-1990 period and also up to 1995. The program for developing the enterprise contemplates an annual labor productivity increase of 1 percent, despite the increase in the depth of the development operations and the length of the workings being maintained.

In order to eliminate restraining factors and to maintain the established capacity of the mine's first phase, construction of airway shaft No 7 has started. With its introduction into operation, tens of workers who work the four inclines will be released, air feed will be increased, and the time for delivering people to the workplace will be shortened. It is planned to turn over two levels in 1988: at 1,100 and 588 meters. In order to improve ventilation by the time the 1,100-meter level is turned over, it is planned to replace the VTs-5 fan at shaft No 1 by the more powerful VTsD-47u. It is proposed to replace the worn lifting machinery at shafts Nos 1, 2 and 4 with new ones, and to use a seat-cableway in place of the hoist which serves for delivering people. Doing so will enable 6 people to be released.

Mining work is to be improved by increasing the cross-sectional area of the developmental workings that are driven, their timbering being implemented by the pliant five-element AP-5 arch. In order to increase the time between repairs, the repairfree maintenance time of a working, the amounts of workings driven in the unloading zone of a worked-out space, the space chopped out to it, and so on, will be expanded. This will enable the work connected with delivering and unloading materials and equipment to be mechanized. The erection of molded phosphogypsum strips above entries will save lumber.

KMT longwall mining machines with the RKU cutter-loader, which has a chain-free transmission, will be introduced at the m<sub>3</sub> seam. The use of polyurethane compounds for strengthening roof rocks by injection will be increased. Longwalls on the h<sub>4</sub><sup>H</sup> seam will be equipped with KM-103 longwall miners.

The following should be done to reduce labor intensiveness of underground transport operations: during the mine's first phase, use the more powerful 1L-100u conveyors and reduce their number from 11 to 9, introduce ARP-28 electric locomotives, on-the-ground and multiple-rail roads and the containerization of freight deliveries, and increase the level of containerization when working an inclined floor of the m<sub>3</sub> seam. It is planned to reduce the labor intensiveness of operations during traversal of breakthroughs--thanks to KN-78 development cutter-loaders, and when driving development excavations--thanks to the introduction of telescoping conveyors. Lumber will be saved by increasing the use of a metal network made of glass-reinforced plastic as lagging. Various types of telfers will be introduced for loading and unloading work.

Repair quality and the use of equipment will be improved as a result of reducing the time spent on assembling and disassembling operations and on technological transitions from face to face, raising the level of the operation of machinery and equipment and of preventive maintenance. For normalization of the heat conditions at workplaces, it is planned to drive holes 2.3 meters in diameter and 1,020 meters deep. This will enable the productive activity of the existing refrigerating installations to be increased. The main degassing fixture in the mine will be replaced. With a view to improving the quality of the coal mined, a comprehensive system for controlling output quality (KS UKP) will be introduced. For production needs, the use of mine water at the mine's surface will be increased to 210,000 m<sup>3</sup> per year.

Because the amount of equipment arriving at the mine increases each year, it has been decided to erect a new building for the machinery shop and to equip it with a telfer installation, which will reduce manual labor expenditure. The conveyors at the surface operating complex will be replaced.

Nature conservation measures are planned. With a view to reducing discharges of harmful substances from the mine's boilerhouse into the atmosphere and also to get full combustion from the solid fuel, all the boilers are being reequipped to burn the coal in a fluidized bed. We are getting ready to build a storage for fuels and lubricants, and a chlorinating installation will be erected.

Substantial resources have been allocated for landscaping the mine surface and the settlement. Construction of a greenhouse with a useful area of 1,000 m<sup>2</sup> has been started. In 1986 about 500 mine workers' families will receive garden plots. Also, favorable loans and land plots for individual construction will be allocated. Construction of a health center with 200 places is being completed.

Execution of all the contemplated measures will enable the plans set for labor productivity, the prime cost of producing output, and increase in the quality thereof to be carried out. In the first quarter of 1986 the plan for mining was met 107.7 percent, for drifting 112.4 percent, and for coal improvement 112.3 percent. Labor productivity per mining worker was 45.6 tons per month under a plan for 44.1 tons. Coal ash has been reduced 0.9 percent.

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## CIVIL AVIATION

### LUCH-74 FLIGHT DATA ANALYSIS SYSTEM AT YUZHNO-SAKHALINSK

Moscow VOZDUSHNYY TRANSPORT in Russian 29 Nov 86 p 3

[Article by VOZDUSHNYY TRANSPORT non-staff correspondent S. Ponomarev, Yuzhno-Sakhalinsk under the rubric "For Flight Safety": "Electronics for the Runway"]

[Text] "Our work can be compared to the work of a cardiologist," said Oleg Butyrin, holding a perforated tape and once again casting a glance at his electronic equipment. "In the same way that they think about the health of people, we ensure the safety of flights. Even the terminology is similar. In medicine it is a cardiogram, we have an oscillogram..."

O. Butyrin is twenty-five. For a manager of the Flight Information Decoding and Analysis Section (FIDAS) for the Sakhalin Production Association, it is, to put it bluntly, an "unimpressive" age. Three years out of the institute and he already heads up a collective of twelve people. And what people! Several of the specialists in the group were recently part of flight crews and have up to 30,000 hours of flight time to their credit.

The Luch-74 system was received by the Sakhalin people ahead of schedule, it can be said: the neighbors in Kamchatka were unable to prepare accommodations for the apparatus, and then it was decided to hand over the complex to the eastern association.

The Luch is very promising: it considerably accelerated the decoding of flight information and improved its quality. And what is perhaps most important: the complex included what is perhaps not the most advanced, but is nonetheless, a computer--the M-6000 minicomputer. Finally the opportunity has appeared to show one's worth as a mathematician and a programmer.

The FIDAS collective themselves erected an extension for the Luch apparatus. O. Butyrin does not shun any kind of work: he has proven himself as a construction worker, sanitary engineer and even... a planner.

The crews had quite a skeptical attitude toward the new objective monitoring equipment: "Well, go ahead and monitor, and we'll wait and see what comes of it."



Times have changed, however. Translated into the harmonious language of algorithms and graphical constructions, the flight information became the basis for serious reflection. The Luch steadily brought the oscillograms of decoded flights to the surface, and took the skeptics by storm. It was as before: one cannot be a dashing pilot and go out and commit clear violations.

"Association Deputy Commander V. Solovyev and subunit commander A. Gritsun helped us convince the aviators that it is bad to joke with us."

Some pilots still joke: "It has become impossible to work. We are 'under the microscope' with Oleg."

But seriously, the situation has changed radically. Crew self-discipline has become more strict, and those violations that are still encountered come not from foolhardiness or showing off, but from technical flaws.

In other words, after the disease is cured, the time for prevention arrives.

It would seem that the heights have been reached. It is possible to stop and, living on what has been accumulated, peacefully increase the volume of decoding. The more so as roughly half of the association flights are now being monitored.

"By the middle of the next five-year plan, the monitoring will be all-embracing. There is no doubt of this." Butyrin shows computations and calculations for the upcoming five-year plan.

Vladimir Ivanovich Skripnik, an pilot inspector for the flight department of Far East Administration transport aviation, met O. Butyrin, as they say, in an hour of need. The prospects for the group were quite unconventional. V. Skripnik proposed that not only violations be uncovered and their prevention be undertaken, but that the trends in the flight activity of craft commanders be determined, and the work of the subunit commanders be raised and the quality of administrative decisions be improved.

I won't go into the technical details of the method, the more so as they have already been described in the newspaper. Substantially different. This difficult task genuinely interested O. Butyrin, and this is notwithstanding the fact that he encountered a whole series of still insurmountable difficulties.

Chief among these is the weakness of the material and technical base of the association and the organizational discrepancies the group constantly runs up against. FIDAS today is formally just a subunit of the aviation technical base. The specialists actually have no effect on the economic indicators of the base. Hence the quite cool attitude of the "technicians" to the needs of the "electro-techies." Getting help is very very complicated.

It is possible that this situation is a remnant of a chronic sickness. "The decoding of flight information is not the most important thing. The FIDAS workers can wait with their requests"--this is the main symptom of the ailment. As a result, it turns out that every FIDAS has its own system for

calculating economic indicators, while those standards that were developed some other time at the ministry are hopelessly out of date.

"Frankly speaking," said Oleg, not looking for euphemisms, "the incorporation of computer technology has been shamelessly delayed here. Had computers appeared here in the association at least five years ago, many problems would have been removed. Whether we are talking about questions of planning, bookkeeping or accounting for material and technical resources. The point is apparently the inertia of some managers and their habit of working by rote."

"The plans we have are in general quite extensive. We plan to get a new complex--the Luch-84--and construct a new floor for the extension. I am thinking about incorporating an automated system for testing the pilots' knowledge of upcoming routes. But what's the use? Can't get any funding..."

Eight years ago O. Butyrin was standing at a crossroads. On the one hand, he wanted to be closer to planes, and on the other, programming beckoned him. He chose the second--the future is still electronics.

His brief and not yet especially remarkable biography reminds me of one of the lines that is obtained in decoding flight information: the track on the oscillogram that extends in a straight horizontal line, when the aircraft has reached a certain altitude, and then suddenly goes up--this means that speed is increasing, the loads are increasing and the goal, still somewhat far off, is becoming closer and closer.

12821

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## CIVIL AVIATION

### PARTS SHORTAGES HAMPER KIEV AIRCRAFT PLANT PRODUCTION

Kiev RABOCHAYA GAZETA in Russian 6 Dec 86 p 2

[Article by engineer A. Gorobets, Kiev, under the rubric "A Sharp Signal":  
"Without Pipe--A Washout"]

[Text] Every airliner, before it goes into series production and then goes out to the air routes, undergoes prolonged testing in wind tunnels--large pipes--that imitate flights under real conditions in the sky.

But I am not talking about about experimental assemblies, but about the most ordinary if, it is true, high-quality and thin-walled, pipe, without which modern aircraft cannot be built. And there is not enough of it month to month for the aircraft builders of the Kiev Aircraft Production Association imeni 50th Anniversary of October. For the simple reason that the Nikopol Southern Pipe Plant considers the fulfillment of its delivery obligations to be a matter of secondary importance.

Thus, since the beginning of this year alone, the Kiev workers were undersupplied by more than six thousand meters, or 25 percent of requirements, of thin-walled seamless pipe. And the Kiev aircraft builders have only received 21 tons of the 37 tons of solid-drawn pipe necessary for aircraft production.

The situation is further aggravated by the fact that these undelivered tons and meters turn out to be articles of the most varying sizes or, as the suppliers call them, positions. Thus, the aircraft builders have not received 16 of the 24 positions required in solid-drawn pipe. And 29 of the 54 seamless ones! More than half.

Try and build the planes without the essential parts!

But the Kiev workers are building them nonetheless. And their offspring transport passengers punctually and reliably. But at what price the fulfillment of the plan is achieved! The best machine-tool operators, magicians in the art of lathe work, have to turn, say, a pipe with a diameter of 40 mm [millimeters] and a wall thickness of 1 mm from a solid blank. How much steel, and moreover not plain steel but high-quality chromium-nickel brands, goes to waste because of the Nikopol metallurgists!

Telegrams, letters or any other requests do not help. The managers of the Southern Pipe Plant defend themselves with silence like an impenetrable wall. In any case, neither enterprise Director G.I. Khaustov nor the acting chief of production, S.D. Ryaboshapka, have been able to give an intelligible reply on the causes of the supply disruptions.

And this is understandable. Who wants to acknowledge their own ineffectiveness? After all, the blanks for the production of this same pipe are received by the plant punctually and in the full amounts. The failures occur in transfers of the semi-manufactures from shop to shop.

Of course, according to the new management principles that are now being affirmed, the Kiev workers regularly come forward, while the Nikopol workers pay penalties for the disruption of orders. You can't replace the pipe with money, however.

And what if you made a plane without the essential parts, a motor vehicle without wheels, a locomotive without a pantograph? For an experiment, personally for the managers of the Southern Pipe Plant? Will they get far with such transport? It is true, if such a situation were to occur, comrades G.I. Khaustov and S.D. Ryaboshapka could easily justify themselves. They would say that the transport is suitable. That is why, they say, we cannot break out of our own irresponsibility and ineffectiveness...

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## CIVIL AVIATION

### CIVIL AVIATION DISCUSSIONS WITH THAILAND REPORTED

Moscow VOZDUSHNYY TRANSPORT in Russian 9 Dec 86 p 3

[Unattributed article under the rubric "The Meridians of Collaboration": "Useful Contacts"]

[Text] A delegation from the Kingdom of Thailand visited the Soviet Union at the invitation of the USSR Ministry of Civil Aviation.

Among the delegation, headed by the permanent secretary of the Ministry of Communications, Luang Joengzhan Kambkhu, were Aviation Department General Director Dr Chitti Vakkharasindkhu and council of directors of civil aviation member Air Marshal Surayyut Nivasabut, as well as representatives of the national airline Thai Airways International and the Ministry of Foreign Affairs of Thailand.

Collaboration between the USSR and Thailand in the realm of air connections began 15 years ago. An intergovernmental treaty between the two countries was signed on 6 May 71. On November 6 of that same year, an IL-62 made the first regular flight on the Moscow--Teheran--Karachi--Delhi--Rangoon--Bangkok route. Aeroflot is currently making flights to Thailand twice a week with an intermediate stop in Bombay.

The Moscow--Bangkok air route is characterized by high commercial traffic and economic efficiency of shipping. Tens of thousands of passengers and hundreds of tons of different cargoes have been shipped over this time along the air routes by the Aeroflot aircraft connecting Moscow and Bangkok. This is one of the longest international routes of Aeroflot--about 12,000 kilometers.

The great significance attached to developing this route is explained by the fact that Bangkok is a major trade, commercial and industrial center of Southeast Asia. The most important air and sea routes in the region converge here. The establishment of regular air connections between the USSR and Thailand, brought about by the development of economic, trade and cultural contacts between the two countries, has made it possible to carry out shipping not only between Moscow and Bangkok, but to open up a Copenhagen--Moscow--Bombay--Bangkok route. This route has united the Scandinavian countries with Southeast Asia.

A delegation from the Ministry of Civil Aviation visited Bangkok in November of this year. During meetings and negotiations with representatives of the Ministry of Communications of Thailand, issues in the further development of relations in the realm of air connections between the two countries were discussed.

A second round of negotiations was held in Moscow. As a result, specific agreements were reached. In particular, for the more complete satisfaction of demand for air shipping, a widebody IL-86 will take the Moscow--Bangkok route instead of an IL-62. The development of exports to the Soviet Union from Thailand will be facilitated by the introduction of an Aeroflot freight route from Bangkok to Moscow, which will be accomplished by an IL-76. The national air company Thai Airways International received an analogous right.

The negotiations were conducted in a friendly atmosphere in a spirit of mutual understanding and respect for the interests of each other.

As part of the program of their visit to the USSR, the guests from Thailand viewed the sights of Moscow and made a trip to Leningrad.

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## CIVIL AVIATION

### BRIEFS

**LITHUANIANS LACK TU-134A ENGINES**--Recently the Lithuanian Administration of Civil Aviation received new Yak-24 aircraft rated for 120 passengers. We will have to service them for the first time. And right away in such a difficult season as winter. We started preparing for this in good time. We composed a plan for the execution of measures and an equipment repair schedule. We designated those responsible so as to implement control over plan fulfillment. The collective of the scheduled maintenance shop (chief I. Ignatov), on whose shoulders rests the principal volume of work, prepared well for the winter. We were greatly assisted by the turnover of another building of the ground facilities by the construction workers in the fourth quarter, where the section for the lab testing of aviation and radio equipment, the installation of engines and the chief mechanic's department are located. Frankly speaking, difficulties and unresolved issues exist. Unfortunately, we feel an acute shortage of engines for the Tu-134A and some spare parts. There are many reprimands with regard to defects in the special transport, especially the motorized primers, which frequently broke down during the last flying season. And there is another thing I would like to mention. When, finally, will the question of work clothing, especially winter clothing, be resolved? It is long past the time to switch the summer boots for more comfortable and warmer footwear and to make jackets that are compact and short and do not interfere with movement for the technical personnel. [By Vilnius Airport ATB [aviation technical base] Chief I. Kuzmenko] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 11 Nov 86 p 1] 12821

**AN-3 TESTING IN KRASNODAR**--A group of specialists from the State Scientific Research Institute of Civil Aviation [GosNII GA] has returned from Krasnodar, where the experimental An-3 aircraft underwent the first stage of state testing. The scientists determined the technical flight characteristics of the new craft--rate of climb, stability and controllability--and evaluated the operation of systems and equipment. During the second stage, which is projected to be conducted under operating conditions, the power plant and air-conditioning system will be tested. The specialists are also researching the agro-technical characteristics of this aircraft, since an improved spraying and dusting apparatus will be installed on the airplane. [By GosNII GA lead engineer A. Vislyayev] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 20 Nov 86 p 2] 12821

AIR CONDITIONING SYSTEM TESTER--"Air-conditioning systems verification panel"--that is what the new joint development of the scientists of GosNII GA [State Scientific Research Institute for Civil Aviation] and the Ministry of the Aviation Industry is called. The portable instrument makes possible the real-time detection of defects in the air-conditioning system of the Il-76, Tu-154 and Yak-42 aircraft. Its employment at operational enterprises of the sector will reduce the number of unnecessary replacements of system assemblies, reduce the labor intensiveness of maintenance, raise its quality and increase the reliability of inspection. Acceptance testing, projected for the end of the year, will be conducted at airports in the Moscow zone. [By GosNII GA department chief N. Belokon] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 20 Nov 86 p 2] 12821

IL-86 SERVICE EXPANSIONS PLANNED--The flight geography of the Il-86 airbus will become even broader. It will be received by the airports of Murmansk, Khabarovsk, Komsomolsk-on-Amur and the city of Frunze. Recommendations that will assist the operational workers in preparing to receive the widebody airliner are being developed by the scientists of the Aeroprojekt State Planning, Surveying and Scientific Research Institute of Civil Aviation [GPIiNII GA]. These documents envisage a large group of measures, beginning with lengthening the runway, expanding the taxiways and constructing hard stands and concluding with the organization of passenger service and the handling of baggage and freight. [By Aeroprojekt GPIiNII GA department chief V. Berezin] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 20 Nov 86 p 2] 12821

TITANIUM ALLOY PARTS REFURBISHED--A method of chrome plating developed by the scientists of the lead institute of the sector will aid in prolonging the life of several aircraft and engine parts manufactured from titanium alloys. Worn parts now need not be discarded, as was done before. It is sufficient to process them using the new technology, and they will be ready for service once again. The new method of refurbishing makes it possible not only to increase the rated service life of the parts, but to reduce the consumption of spare parts and raise the quality and reliability of aircraft equipment. [By State Scientific Research Institute of Civil Aviation senior scientific staff member A. Ryaboy] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 29 Nov 86 p 3] 12821

MAKHACHKALA AIRPORT RUNWAY IMPROVED--The runway at the Makhachkala Airport of the North Caucasus Administration of Civil Aviation was placed in service ahead of schedule after its reconstruction. Now Tu-154 aircraft can call here regularly. The builders executed all operations with high quality--engineering service lines, the replacement of the radio signal lighting equipment and the concrete surface of the runway and taxiways. For their great personal contribution to the reconstruction of the airport and the initiative manifested therein, North Caucasus Administration employees P. Afanasyev and V. Stepanov were awarded a Certificate of Honor from Aeroflot. The decoration "Exemplary Worker of Aeroflot" was awarded to A. Zhuk and V. Zaika, construction workers of the Sevkastroy [North Caucasus Construction] Trust. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 2 Dec 86] 12821



KA-32 HELICOPTER MURMANSK OPERATION--The first Ka-32 helicopter has arrived in Murmansk. Here in the transpolar regions, the helicopter, new to civil aviation, will have to master the most varied of professions. The helicopter was flown from the plant by a crew headed by the commander of the flight collective of the flight-test complex of GosNII GA [State Scientific Research Institute of Civil Aviation], G. Provalov. The north has long needed such a machine. The Ka-32 will have to deliver drilling crews to rigs in the Barents Sea. The helicopter will be irreplaceable in the installation of electrical transmission lines. On its external suspension, it will be able to deliver containers with products and various goods on-board ships to shores without berths. This will make it possible to improve substantially the supply of coastal settlements. The polar night also does not bother the Ka-32. Among those who will be working with the new helicopter are pilots V. Silov, P. Vyatkin, V. Belov and S. Starikov of the Murmansk Airfield, who quite recently were flying in Mi-2s. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 9 Dec 86 p 1] 12821

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## MOTOR VEHICLES, HIGHWAYS

### TRANSCAUCASUS HIGHWAY CONSTRUCTION UPDATE

Moscow IZVESTIYA in Russian 10 Nov 86 p 1

[Article by IZVESTIYA special correspondent V. Belikov under the rubric "South Ossetia": "A Road Called the TransKAM"; first paragraph is IZVESTIYA introduction]

[Text] A new freight and automobile route lies at an altitude of more than 2,000 meters through one of the most inaccessible passes--the Rokskiy. IZVESTIYA special correspondent V. Belikov reports from the route of the Transcaucasus Highway (TransKAM).

It was impossible to reach the highest point on the road by helicopter. Bad autumn weather tightly cloaked the nearby mountains.

"My Mi-8 would land at the pass in forty minutes," said pilot M. Latachi confidently, looking out the window of the flight building. "But it is dangerous to even think about flying until the wind changes! The seasons can flip-flop in the mountains at any time..."

The helicopters have become something of a technical ambulance on the TransKAM roadway, ready to deliver a broken part or replace a faulty assembly at the request of the road workers. And there are more than enough of such concerns on this most difficult construction project.

It was necessary to lay down a main highway that would duplicate the well-known Georgian Military Highway, which pierced the Main Caucasian Ridge with a tunnel for the first time. This is in a region where the building season, due to the high altitude, runs at most six or seven months of the year, and where avalanches, landslides and unexpected river flooding shortens it even more.

Leaving Tskhinvali, the center of South Ossetia, in a Volga, the parting words of party obkom First Secretary F. Sanakoyev were: "The TransKAM is becoming an artery of life for us which provides the shortest link between the neighbors of the North Caucasus and stable economic relations with the industrial centers of Russia. Along with the construction of the road, it has been possible to bring electricity, gas and water supply to inaccessible parts of the mountain region. In the mountain pastures, we will now be able to breed

the best strains of sheep and cows, and we are even counting on acclimating the Pamir yaks..."

As is done in the mountains, the broad asphalt highway has been laid down along ravines in which the Liakhvi thunders unceasingly, crashing down from distant glaciers. There is much water in the okrug overall--curative waters that give relief from ailments. A trillion liters come from local springs, more than enough for bottling at the mineral-water plant and for a whole network of reservoirs. The resort of Dzhvari is becoming the center of them and is acquiring nationwide fame.

Another quarter of an hour of the trip--it is as if the vehicle is diving into thick milk. The cloud zone has been reached, which the night before did not permit the helicopter to pass toward the most distant South Ossetian settlement of Kvemo-Roka. Somewhere nearby the ethnographic museum will be located someday under the clear sky and will attract a multitude of tourist groups.

The development of the southern portal of the tunnel began from here in 1977, and through which today the Central Caucasus can be traversed by car in a few dozen minutes, avoiding the cliffs, endless snows and ravines. On the other, northern side of this gallery that pierces the ridge, the serpentine route goes to the Ossetian Military Highway leading to Alagira.

During the return, my fellow traveler T. Mdivnishvili, a member of the Collegium of the Georgian Ministry of Highways, related that on 57 kilometers of the new roadbed, dozens of bridges, about two hundred drainage gutters and pipes and several hundred meters of anti-landslide coverage have been constructed. But all of this is still not enough for uninterrupted operation. The second phase of construction should transform the TransKAM into a year-round route that can counteract any tricks of nature.

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## MOTOR VEHICLES, HIGHWAYS

### QUALITY CONTROL PROBLEMS AT KamAZ WORKS

Moscow IZVESTIYA in Russian 4 Dec 86 p 2

[Article by IZVESTIYA special correspondents Yu. Rytov and A. Sabirov in the city of Brezhnev under the rubric "Quality--The Key to Acceleration": "And Then the Conveyor Stopped--Whose Tranquillity Was Disturbed by the State Acceptance Commission?"]

[Text] They speak of this enterprise only in a respectful tone and add without fail: a giant among giants. And that is how it is. Judge for yourself: the value of the fixed capital at KamAZ [Kama Motor Vehicle Works] is equal to its value at ZIL [Moscow Motor Vehicle Works imeni Likhachev], GAZ [Gorkiy Motor Vehicle Works] and VAZ [Volga Motor Vehicle Works] taken together. And much is asked of those to whom much is given.

It was thought that the best trucks in the world would be produced on the best equipment in the world. Ten years have passed since the start-up of the first phase of production. And KamAZ trucks have already taken on a considerable portion of the freight shipped by motor-vehicle transport. All eight models of the new vehicle are produced with the Mark of Quality.

And nonetheless...

Speaking at a CPSU Central Committee conference on November 14, KamAZ Association State Acceptance Commission manager O.V. Kurshev noted that many complaints are still coming in from trucking facilities.

Naturally, the KamAZ workers have tried to eliminate the defects revealed. They took a bold step, creating a firm system of technical maintenance. The "Quality" program that was developed was aimed at the further improvement of first the truck itself, second the technology of production and third the methods of operation.

Time waits for no man, however. The program was composed and measures were planned, but when will all of this have any real results? Perhaps the need for a decisive turnaround has come to a head here as nowhere else.

And KamAZ has become one of the enterprises of the country at which the state acceptance of products was introduced.



And so, the State Acceptance Commission... We visited the KamAZ plants, shops and teams and spoke with many people. Here are some opinions.

"Don't write my name, but I will say honestly and candidly that this is an empty venture that will produce nothing sensible. The administrative apparatus will expand again and there will be more spongers."

"I support it fully. It is long past the time to introduce such a system. We have babbled too much about quality and done too little to improve it. Of course there will be difficulties. It is in our interests, however, to overcome them."

"It is a complex matter. I would say a painful one. 'Forbid and do not allow'--that is the simplest of all. But to help... Will the new service have this purpose?"

As we see, the opinions are ambiguous. Maybe that is how it should be. After all, the State Acceptance Commission will only take the first steps, and the principles of its organization, structure and methodology are not clear to all. Many conversations are about which people will be sent there. Rumors are also circulating about extremely high salaries.

We discussed these topics with O.V. Kurshev.

"As for the salaries, the rumors are unfounded," said Oleg Vasilyevich with a smile, "although the wages are quite appropriate. They will allow us to take on experienced production workers. The indispensable conditions are a higher technical education in one's specialty and production service of no less than five years."

The number is determined by the corresponding scale of production. Whatever else is said, the Kama Association is a whole family of plants. There are nine in the city of Brezhnev alone. Material assets of billions of rubles are encompassed by the overall scope of inspection. There are more than 200 people on the staff of the service today. The number of specialists is proposed to double in the near future. It will even triple in the future.

Let's meet Abakar Garayevich Gadzhiakhmedov, the senior State Acceptance Commission representative at the engine plant. He has a biography typical of the generation. As an engineer, he was hardened in the Kama "hustle with its pep and bustle." Before going on to his new duties, he thought and wavered for a long time. Because he knew that he wasn't going to a cushy job, but to a busy and nerve-wracking one.

"Just look at the opportunities we have at our disposal," said our interlocutor enthusiastically. "Here is the diesel-engine testing station. It operates in automatic mode. A computer tracks and records every parameter. The products receive a completely impartial evaluation overall."

This naturally reflects the high technical level of the enterprise. There are more than 1,800 such measurement and testing systems and installations overall

at KamAZ. It is useless to track technology by eye alone. Precise sensors are needed. Almost half a million inspection and measurement instruments are operating in the shops. The State Acceptance Commission was occupied with the complete revision of these facilities. All, if it can be expressed thus, quality measurement devices were subject to strict certification.

It is also necessary to investigate the "paper sea." Neither more nor less--the association has some 16,500 units of standard documentation. There are 13,000 GOSTs [All-Union State Standards] in circulation alone. Just try and check into them, coordinate them and introduce order. The painstaking and hidden work of the new service properly began here. And the first and not very detailed analysis has shown that 12 percent of the technological operations are executed with violations.

It is correct to pose the question here of where is the quality control department [OTK] looking? After all, the OTK has not been replaced by anyone, it retains its power. There are almost 5,000 inspectors at KamAZ. There would seem to be no operations upon which they do not cast an unblinking eye. What is being done--are more inspectors being placed over the inspectors?

"The OTK is our chief assistant," all of the State Acceptance Commission workers never tire of repeating, "because we share common tasks and purposes. We must reach the highest possible level of quality. This is possible only on a united front with the production workers. That is precisely how we try to arrange our relations."

The State Acceptance Commission is proving to be a real force. As early as October, it expanded the monitoring of finished products. In November about 30 percent of the trucks were covered. In December no less than 70 percent will be encompassed. Starting in the first days of 1987, all of the production volume will be under its observation.

We visited the main conveyor. You can set your watch according to its electronic indicator board. The new trucks come off the line one after another. Then the testing begins, and after that, the State Acceptance Commission. It must be noted that not all vehicles undergo verification. The acceptance is conducted selectively--vehicles are taken from this or that batch at random and unexpectedly for inspection.

"And you don't have to wait for surprises" sighed V.K. Tereshchenkov, State Acceptance Commission representative at the bus plant. "Knowing a day beforehand what is coming, you won't sleep at night. Our work requires maximum principles, it is impossible in any case to make compromises. This uncompromising position takes away the tranquillity of many and leads to conflicts."

And how could they not arise, when the very first "tightening of the screws" led to... the stopping of the main conveyor. The cause of such a dramatic turn of events was defects detected in the chassis of dump trucks supplied to the neighboring Bashkir city of Neftekamsk. The State Acceptance Commission representatives, moreover, found not individual omissions in the vehicles, but a whole series of serious malfunctions.

The electronic indicator board over the assembly line reacted momentarily to the unprecedented delay: instead of the pluses of assembly beyond the plan, there came minuses and minuses. They fell behind the daily schedule indicators, the monthly program began to crack and even the yearly plan fell into doubt. It must be acknowledged openly that many specialist fell into confusion, if not shock.

The psychological inertia was strong, very strong. People had grown used to the "familiar" shortcomings, had reconciled themselves to the violations of technological discipline, they were even not ashamed to put the Mark of Quality onto junk sometimes. The abrupt increase in exactingness provoked outright furious protests. One comrade, for example, without beating around the bush, declared to us (it is true, with the caveat that it was "not stated for publication"): "The State Acceptance Commission is a drag on production."

Well, for poor workmen the State Acceptance Commission really will be a drag on production. For those that are for product quality with all their heart, it will help. It has, as demonstrated by the first Kama experience, effective means of influence. Here is an example. The representatives of the State Acceptance Commission at KamAZ are establishing careful incoming control for all materials and constituent items arriving from outside. Here we should remind you again of the enormous production volumes. After all, related industries supply roughly a billion rubles of products here. These are 464 enterprises of eleven ministries. It is not easy to investigate this most complex system of mutual contacts, and it is even more difficult and complex to interact with negligent suppliers.

"Having studied the situation, we singled out 36 enterprises that had 'tainted' products," related O.V. Kurshev. "We are trying to put up a barrier to them. The situation is being eased by the fact that State Acceptance Commissions have also been introduced at 13 plants and associations since January. With regard to the rest of the suppliers, we are bringing in the territorial organs of Gosstandart [State Committee for Standards]. I think that both the regional centers of metrology and standardization can have an active influence on our fellow industries."

That is how broad the influence of the State Acceptance Commission is. This, we will repeat once again, is not a service called upon to "hold and not allow," but in its essence is a system for product quality management on a national scale. If you look at it closely, the interests of the manufacturer-enterprises and the emerging state acceptance system do not oppose each other, as it might have been presented at another time, but coincide completely. The employees of state acceptance and the material-incentives procedures established for them are directing them toward joint inquiry and constant collaboration. Two basic indicators have been established for bonus payments to state-acceptance representatives at KamAZ: a reduction in the quantity of complaints by truckers and a decline in expenditures for warranty repairs on the motor-vehicle fleet.

The State Acceptance Commission is in no way a campaign, but the development of a purposeful work on the radical improvement of product quality in the national economy. The new approaches must be affirmed more boldly and a psychological restructuring must be carried out. This does not occur without pain anywhere, including at KamAZ. A break with outmoded views and attitudes is underway, and the inevitable re-evaluation of values is occurring. And this is not surprising. That is what the restructuring is for.

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## MOTOR VEHICLES, HIGHWAYS

### ROUNDTABLE ON PROGRESS, PROBLEMS AT YerAZ WORKS

Yerevan KOMMUNIST in Russian 13 Nov 86 p 2

[Report on a roundtable discussion with A. A. Arzumanyan, Yerevan Gorkom Secretary, and others; article prepared by A. Arakelyan under the rubric "Scientific and Technical Progress: An Accelerated Rhythm": "On the Agenda: The YerAZ-3730--Roundtable of KOMMUNIST and the Yerevan Armenian CP Gorkom at the Yerevan Motor Vehicle Works"; first paragraph is source introduction]

[Text] Quite recently the Yerevan Motor Vehicle Works [YerAZ] was among the lagging enterprises of the republic. Over the last two years, the motor-vehicle builders have been able to correct the situation significantly. The plan targets are fulfilled in a stable fashion, and the quality of van output has improved somewhat. The old model, however, still does not satisfy increased modern-day requirements, and the transition to the construction of the new-model YerAZ-3730 van is being delayed, for which the plant collective was criticized at the 28th Congress of the Armenian Communist Party. How the matter stands today, how realistic is the series production of the new model in the second half of 1987, what problems and unresolved tasks stand before the plant--these were the topics of the roundtable discussion. Present were representatives of the USSR Ministry of the Automotive Industry, supplier plants, scientific organizations, and managers of services and chief specialists of YerAZ.

In opening the roundtable, the lead speaker--Armenian CP Yerevan Gorkom Secretary A.A. Arzumanyan--noted the acute need for the timely assimilation of the new van for the national economy of the country. The YerAZ-3730 presents broad opportunities for combining various types: general-purpose, insulated body, refrigerated, furniture transport. At the initiative of the party gorkom and the plant, new prototypes were created that were used as mobile shops and mobile stores. There is the possibility of using it as a camper and a minibus as well as the transport of flowers and bakery products. An order has already been received from the USSR State Automobile Inspectorate for the creation of a mobile laboratory for monitoring the technical state of transport equipment. The current state of affairs at the plant, however, evokes serious concern. The assimilation period is in doubt. The point of the roundtable is to determine just what depends specifically on the plant workers, what on related-industry workers and what on the ministry. Today, when the laborers of the whole country are oriented toward accelerating

scientific and technical progress and the incorporation of the latest achievements into the national economy, we are not correct in referring to any objective causes of lag. There are time periods for the assimilation of series production, and they should be unfailingly maintained.

YerAZ Chief Engineer V.A. Dovlatyan acquainted the attendees with the course of preparations for the assimilation of the new model. For series production of the YerAZ-3730 van, it was necessary to carry out a reconstruction of the blank-stamping, forging, painting and assembly shops, as well as to create a completely new shop for the manufacture and assembly of the front axle, plan and manufacture 1,100 units of die tooling, 900 types of cutting, auxiliary and measuring tooling and machine-tool attachments, 150 types of dies, 283 units of welding tooling and attachments, 4 robot complexes and much more.

All of the enumerated issues and their executors were reflected in an order of the USSR Ministry of the Automotive Industry [Minavtoprom] as early as 1981, according to which the preparations for production should have been completed in 1984, with the beginning of series production in 1985. In connection with the disruption of the time period, all executors prepared a new composite step-by-step schedule with a time frame for the completion of preparations and the beginning of series output in the second half of 1987.

The blank-stamping and assembly shops have already been placed in operation, as has the first phase of the paint shop. It is still necessary to realize some 6 million rubles of capital investment to complete the reconstruction of the forging shop and the body primer line, the equipping of the assembly shop and the creation of the front-axle shop.

The pace of the reconstruction work, however, does not ensure the fulfillment of the step-by-step schedule due to delays in the manufacture and supply of mechanized welding lines and multiple-electrode welding machinery from the Zaporozhye Avtopromsvarka [Automotive Industry Welding Equipment] NPO [Scientific Production Association]. The question of financing capital construction on the part of the ministry has not been resolved. Planning solutions for the primer line are lacking.

Of some 900 types of machine-tool and measuring attachments and cutting and auxiliary tooling, 400 are not yet planned, including 150 of some 280 welding tools. The planning is being carried out by plant specialists and will be completed by the end of the year.

The question of planning the dies for original plastic parts, especially complex ones such as the instrument panel, arm rests, handles and the steering wheel, causes concern. The complexity of it is the fact that their production is not planned for the plant and correspondingly there is no equipment for which it is necessary to secure and plan the tooling, and on the other hand there are no specialists at the plant for planning the complex dies for the plastic parts.

Out of 1,100 cold die forgings for a total volume of 9 million rubles, 370 for 3 million rubles have been manufactured. Out of 125 large die forgings--just 34. Of the remaining 730 dies, 230 are distributed among other ministry

plants, and the rest are subject to manufacture at YerAZ. The principal suppliers of the large dies are the Zaporozhye Motor Vehicle Works and the Gorkiy Die and Forgings Plant of the GAZ [Gorkiy Motor Vehicle Works] PO [Production Association]. The preparation rate of the die tooling is still unsatisfactory both at YerAZ and at the other ministry plants.

Of 900 types of machine-tool and measuring attachments and cutting and auxiliary tools, there exist about 150. Special process welding equipment in the overall amount of 3.6 million rubles is being manufactured at the Zaporozhye Avtopromsvarka NPO. Only one of the 4 robot complexes is on hand.

The supply of constituent parts and assemblies is basically on schedule with the exception of some items. Chief among these is the beam forging of the front axle from the Kutaisi Motor Vehicle Works, which has agreed to supply the forging without heat treatment, which means there will be a breakdown of the beam in the first overloading or a blow under operating conditions. We also are having difficulties with the main brake cylinder, the manufacturer of which according to the shop-to-shop routing of planning organizations is the Armavto [Armenian Motor Vehicle] PO, and with the intermediate cardan shaft, whose supplier is the GAZ PO.

Question from a participant: New series of motor vehicles usually occur once every 10-15 years. In preparing for their production, unusual steps are always undertaken. How are the plant technical services showing their worth on this plane?

[Answer] All of the reconstruction and installation of equipment is being conducted by the manpower of the enterprise itself. When there is a shortage of tooling welders, we organize a second shift. The first experimental prototypes of the new van, from the very first days of their output, will undergo operational testing under urban conditions, and soon their run-in in rural terrain will begin, which will make it possible to reveal the vehicle's shortcomings under difficult operating conditions.

YerAZ Director V.G. Nersesyan: We have been occupied with preparing the assimilation of the new van since 1980. To say that it has been dragged out quite a bit is hardly original. But we are trying to get out of the hold-up. It is now clear to the collective what to do and how and when to do it. There exists a specific aggregate ministry schedule, and on the basis of that schedule we have developed our own work schedule for each problem and every shop and department. There is also a schedule with the institutes and tool and die planners.

Question from a participant: If all is clear, then the projected quantity of vehicles will be produced in 1987?

[Answer] Unfortunately there are still many unresolved problems. I'll start with the plant. While there have been certain successes in reconstruction and the creation of capacity, there exist great time deficiencies and omissions in the preparation of production. There is also a lag on the part of the suppliers and, basically, Zaporozhye, which is definitive for us: the major parts and special welding equipment are manufactured there. There are several

issues that have still not been technically resolved with regard to plastics, heat treatment and mechanical machining. Notwithstanding the increase in tooling production, it is still a weak link for us. The paramount task in the body shop is the conversion of those same spaces to the new model. The resolution of these issues in precise adherence to the schedule will allow us to reach the projected line in 1987.

Question from a participant: What is bothering you--your own schedule or the schedule of the suppliers?

[Answer] Preparation is defined as three aggregate instances: the completion of reconstruction and new construction in the plant, the manufacture of process tooling, dies and attachments and the manufacture of special welding equipment.

We will complete the reconstruction in the first half of 1987, the work is proceeding satisfactorily. The question of financing for the acquisition of equipment (6 million rubles), however, must be resolved. According to the contracts that have been concluded, the orders for process tooling, special technical equipment, special metal-cutting equipment and the first set of die tooling have already been placed. They must be paid for.

We will complete some of the process tooling ascribed to us, notwithstanding the lag. At one time, when we were part of the Armavto PO, the manufacture of cutting and auxiliary tooling was envisaged at the Yerevan Motor-Vehicle Assemblies Plant. After the plant left the association, the program remained with us. We have requested help with its manufacture. This could be done at the Charentsavan Tooling Production Association. Today we have become specialized in the manufacture of cold die forgings and welding attachments.

The manufacture of dies for the plastic parts remains an open question. We are very much to blame here. We will finish the planning soon, but where will they be manufactured? In short, we are coping with our schedule, but the suppliers...

Question from a participant: Is the training of personnel in such specialties as electronics, programming and complicated robot complexes being conducted?

[Answer] Training is being conducted, but the pace is unsatisfactory. We have created a group that will go to the manufacturer plant for training upon receipt of a robot complex. We have hired electronics workers, but not programmers yet. We must collect people and send them for apprenticeship.

N.N. Ashikhin, chief of tooling production for AvtoZAZ [Zaporozhye Motor Vehicle Works]: YerAZ has placed orders for 90 large die forgings with us. Some 25 have already been manufactured today. Some 65 were ordered in May of this year. We genuinely want to help the plant and, moreover, as fast as we can. A certain inertia, however, is being observed up to the present time with our partners from YerAZ. Say tooling has been ordered, but questions of the casting drawings have not been resolved. The master-die is still unclarified, and without it we practically cannot order the casting (the



casting template). At AvtoZAZ we now have, as they say, a window when we can make the tooling. These questions must be resolved immediately.

At the same time, a request to ministry employees for additional allocations of funding for casting, at least within the limits of 500-600 tons, has been made. Then we will be able to produce tooling of 250,000-300,000 rubles (13 large die forgings) before the end of the year and 500,000 (30 die forgings) in 1987 and 20-22 parts in 1988. But if the question is worked out with the specialists of YerAZ, then we can produce formative ones with finishing on the spot. For our part, we are tightening the monitoring and exactingness of tooling manufacture.

V.K. Chernov, chief designer of the Zaporozhye Avtopromsvarka NPO: We now have four pieces of machinery in production. The completion of their manufacture according to schedule is expected this year. Their delivery to YerAZ still does not signify, however, that they are suitable for use, because they will not be adjusted here for the use of existing parts (dies): we have not received them from YerAZ. One of the machines remains in a difficult situation. It was planned for turnover in the first quarter of 1987, but due to a series of reasons it will not be ready. Realistically it can only be finished in the second quarter.

V.S. Teplov, deputy chief of the Main Administration for the Production of Process Equipment and Tooling of USSR Minavtoprom: Overall the YerAZ collective is sufficiently qualified and capable, and it has shouldered those tasks that are before it. The work that has already been done testifies to that. There are still, however, many unresolved and disjointed issues in the interconnections with various organizations in organizational affairs. The main thing, however, is that I did not sense firm confidence and a psychological mindset of the collective for the serious improvement of operations. This must be corrected immediately.

As for the welding equipment, it seems to me that there is no cause for worrying about the fulfillment of the schedule. It is law for us. And discussions of the disruption of the schedule on the part of the Avtopromsvarka NPO are not serious. In order that the questions of the turnover of equipment be resolved more efficiently, it is necessary to re-sort the die forgings that can first be made on already existing welding equipment. A well-defined study of upcoming work is needed here.

Regarding the robot equipment, I would like to note that the plant had a request to supply four complexes. The issue is already resolved for three of them (they are already at the plant). As for the fourth, the ministry will give an answer at the end of November. By the way, the same kind of complexes have been installed at the Minsk Motor Vehicle Works, and the specialists have to go there for experience.

The question of the front axle also draws serious attention to itself. This is a difficult task for the plant--to obtain a whole mechanical-machining section from UAZ [Ulyanovsk Motor Vehicle Works], install it, modernize it here and manufacture high-quality blanks. The required quality cannot be realistically obtained from the Kutaisi Motor Vehicle Works: they do not have

equipment for heat treatment there. An attempt must must therefore be made to resolve the issue temporarily at the plants of the republic.

Ye.B. Levichev, chief of the Main Technological Administration of USSR Minavtoprom: In my opinion, the questions raised at the roundtable should have been advanced before the ministry or the main administration. They have long been brewing. And we should be thankful to the editorial staff of the KOMMUNIST newspaper and the Yerevan Party Gorkom for the valuable initiative. I am occupied with questions of production preparation for the sector. And this is how I evaluate the current situation at YerAZ: the situation is extremely strained and it will cross the line of disruption if we do not radically and immediately change our attitude toward the matter. First and foremost on the part of the plant, main administration, the ministry and all organizations involved. After all, the party is calling upon us to act with a maximum return on our efforts, and the time for stirring things up has already passed. I should note that the preparation for the assimilation of the new model are not being conducted in this fashion. The production preparation service headed by the chief engineer is clearly not getting things done. Many of the questions today have been unexpected for all of us, including the plant workers. Moreover, seeing the questions, we still do not see solutions. The problem of the plastic has not been solved, there is no manufacturer or group of equipment, and this means that it is impossible to plan process tooling and manufacture it. The plant workers are not consistent in their actions. In August, specialists from the plant were at the ministry, they were in my office, and they received an official stamp on the question of the main cylinder, but there is no solution, and up until today no one had raised the question again.

The new YerAZ-3730 van is needed very much for small-scale conveyance in urban conditions. The vehicle is built of approved assemblies and, it seems, will be reliable in operation.

But this is what bothers me about the new vehicle: how to avoid the sad "praise" of the previous model for it. We must keep our honor from the beginning. Therefore, questions of quality must be resolved as early as today. There is still not full clarity on this matter. Questions of metrology are resolved poorly, inspection attachments have not been ordered, the vehicle has not been tested all the way. New processes of mechanical machining are appearing in which the plant does not have much experience. The management of YerAZ must specially consider questions of vehicle quality and its technical, technological and organizational support. And the main thing: the psychological thrust of the collective must be changed at the roots. Let's take several vehicles to the proving ground in Moscow and let the specialists there inspect them scientifically. As for the production of tooling, it is essential to develop a part-by-part schedule for manufacture and delivery.

The relations of YerAZ with the "outside world," and especially with the ministry, are also deserving of reproach. The plant workers are rarely at their places and are inert and passive.

G.A. Zavodnov, first deputy chief of the Main Administration for the Production of Buses and Motor Vehicles with Specialized Bodies of USSR Minavtoprom: Over the last two years, the plant has begun working more steadily and has sharply improved the culture of production, and many processes have been mechanized.

There is, however, no reason for complacency. Furthermore, the current situation with the assimilation of the new model arouses the most serious alarm. We have therefore now taken the preparation for production under especial monitoring.

For many years we produced a single model that was not up to the level of the needs of the times. It is impossible to improve quality substantially without the transition to the new model. Moreover, if in 1987 we do not place the new model into series production, then in the next three years the price for the old model will be reduced by 5 percent. And this means that the plant will face financial disaster. Today all of the bus plants of the country are converting to new models. The assimilation of the new models is the immediate task of the ministry.

We have somehow neglected the preparations for the YerAZ-3730 van. In any case, however, as early as the third quarter of next year, as planned, we must begin the output of the new model. It is impossible to permit a dual program of production--the old and the new models. There is no free space. We for our part will help in every way. The new model unfailingly should have the Mark of Quality and be economically advantageous.

Many questions have still not been resolved. Say, the question of payment for equipment--most complex. It is necessary to take a list of equipment and show where in the plants it is placed, all quite thoroughly. We will give you this money only with full justification.

A well-defined, cooperative, part-by-part working schedule for the third quarter of 1987 is needed today. Every week a new-model day should be held at the plant. The chief engineer should come to Moscow every month with a detailed and specific report: what was done over the month, what must be done in the upcoming period. Once a quarter we ourselves will come to Yerevan. The talk of preparation should be transformed into daily work.

It is necessary to be seriously concerned with the training of personnel and to send them to related enterprises for apprenticeship--especially to RAF [Riga Bus Works]. Young specialists are needed. And another thing. Without the aid of the city and republic party organizations, we will not be able to manage. Only together will we be able to get out of the breakdown.

B.M. Mkrtchyan, editor of the newspaper KOMMUNIST: For many years the Yerevan Motor Vehicle Plant has been the object of criticism by not only the republic, but the national press. The dissatisfaction was provoked first of all by the quality of the vans produced, a lack of rhythm in the operations of the enterprise and the poor culture of production. Today much has changed for the better. But there are still, as the comrades from the ministry have noted, no radical changes: the technology of production for the model is too dated. Our

roundtable was organized for the purpose of assisting in the timely assimilation of the new model YerAZ-3730 and the resolution of many unresolved questions. We will hope that our meeting will assist in smoothing out the design work and lay the beginning for the well-coordinated activity of all organizations and enterprises.

The editorial staff of the newspaper KOMMUNIST will especially monitor the course of production and will provide publicity for the work of the whole collective of the plant and its partner-suppliers and the corresponding services of the USSR Ministry of the Automobile Industry. It seems that publicity will serve the common cause: urge on the remiss and bring moral satisfaction to those who work well.

We have experience in sponsoring the most important objectives of the republic. Practice has demonstrated the effectiveness of an approach where we send our publications to the corresponding ministries and departments and party and soviet organs of the republic and oblasts for their specific reaction. We will be consistent in our actions in the issue of YerAZ as well.

In the name of the editors and the Yerevan Party Gorkom, we thank all of the participants in the roundtable for consenting to participate in its work.

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Upon conclusion of the roundtable, the participants signed a joint protocol according to which the questions subject to resolution by specific executors in specific time periods were defined. Each month, KOMMUNIST will inform the readers on the course of operations in assimilating the new model of the YerAZ-3730 van.

12821

CSO: 1829/93



## MOTOR VEHICLES, HIGHWAYS

### BRIEFS

KIROV-VERKHOSHIZHEMYE HIGHWAY OPEN -- Kirov -- The state commission has signed an act accepting the new Kirov-Verkhoshizhemye highway as operational. The asphalt right-of-way extends from the oblast center to remote Verkhoshizhenskiy Rayon for more than 80 kilometers. So-called "lean" concrete was used here for the first time on a wide scale as the covering. Specialists from the Kirovavtodor [Kirov Highway] Administration assembled the unit for preparing the mixture of crushed stone with a small additive of cement directly on the right-of-way. This mixture is levelled using a standard grader and then compacted with the help of rollers. After the application of a small layer of asphalt, the road is extremely durable, and its cost is even somewhat lower than using the standard method. The builder brigades, headed by M. Kormshchikov and N. Biserov, and other collectives in the Kirovavtodor Administration labored on the construction start in an urgent manner. [By IZVESTIYA correspondent A. Yershov] [Text] [Moscow IZVESTIYA in Russian 23 Oct 86 p 1] 8802

PAVED ROAD TO BREYTOVO -- Breytovo (Yaroslavl Oblast) -- The highway builders completed the last section of the asphalt road on the eve of the Great October holiday. Freight and passenger traffic has been opened on the large right-of-way that connects the most out-of-the-way rayon in Yaroslavl Oblast with the oblast center. Now, the people of Breytovo can easily travel to the cities of Uglich, Andropov and Yaroslavl; the rayon centers of Novyy Nekouz and Myshkino; and large villages. The new route is opening up broad opportunities for the further social and economic development of this remote rayon. [By B. Svishchev] [Text] [Moscow SELKSKAYA ZHIZN in Russian 8 Nov 86 p 4] 8802

PAVED ROAD TO USTINOV -- Udmurt ASSR-- The "green light" has smiled on automobile drivers on the new asphalt highway that connects the city of Ustinov with the northern portion of Udmurtia. During the impassable autumn season of bad roads, the significance of this highway is especially perceptible. It has literally become a "road of life" for Glazovskiy, Balezinskiy and other rayons. The autonomous republic began a broad offensive against the lack of good roads during the 12th Five Year Plan. The local councils have concentrated the efforts of the builders on the main avenues. Another ten rural rayons must be connected with a strong network of motor vehicle communications at accelerated tempos. [By IZVESTIYA correspondent A. Sabirov] [Text] [Moscow IZVESTIYA in Russian 19 Nov 86 p 5] 8802

IVANOVO-YAROSLAVL PAVED HIGHWAY -- Ivanovo-- It is now possible to get from Ivanovo to Yaroslavl by motor vehicle much faster. The new 137-kilometer Ivanovo-Gavrilov Yam-Yaroslavl republic highway has helped to make this possible. Traffic by all types of motor transport has been opened up on it. An asphalt road-bed has replaced the impractical crushed-stone pavement that had served for many years. It has shortened the direct route between the two oblast centers by 40 kilometers. [By N. Usov] [Text] [Moscow IZVESTIYA in Russian 9 Dec 86 p 3] 8802

ZIL-MMZ-45054 DUMP TRUCK PRODUCTION -- The Mytishchinskiy Machinebuilding Plant began the production of the new ZIL-MMZ-45054 model dump truck in November. The design of the cab, upper frame and hydraulically operated lift of the new model has been changed. The vehicle operates on compressed natural gas. Hundreds of the new model of dump truck will be manufactured before the end of the year. [By G. Maltsev] [Text] [Moscow PRAVDA in Russian 30 Oct 86 p 2] 8802

IMPROVED MOTORCYCLES PLANNED -- Udmurt ASSR -- Reliability, economy, high cross-country capability -- these are the qualities of the new Yupiter motorcycle which the Izhmash [Izhevsk Machinebuilding] Association is producing. This is the leading model in the fifth generation of the Izhevsk family. The Planeta-5 motorcycle has been developed and is being prepared for serial production. The designers have completed preparations for modifications to the Lyuks, Turist and Sport. V. Solomentsev, the motorcycle production director, says: "A new basic model with a four-stroke engine, a front wheel disc brake, a pneumatic telescoping yoke, and molded wheels is also being designed. This will be the sixth generation of "Izhevsk". The more improved Saturn will replace the Yupiter. [By IZVESTIYA correspondent A. Sabirov] [Text] [Moscow IZVESTIYA in Russian 9 No 86 p3] 8802

120-TON DUMP TRUCKS PRODUCED -- The family of "heroes" with the logo of the Belorussian Motor Vehicle Works has been reinforced. The new 120-ton quarry dump trucks do not yield to similar foreign ones in their technical and economic characteristics. The first machines have been sent to the Yakutalmaz [Yakut Diamond] Production Association. These dump trucks do not beneficially differ from 110-tonners only in their increased cargo carrying capacity that has been achieved by reducing their weight. More powerful -- 1,200 horsepower -- engines, which are more reliable and economical thanks to a water-oil heat exchanger and a pneumatic starting system instead of an electrical one and which are capable of working without a hitch in the quarries of Siberia and the Far North, have been mounted in the new machines. The designers of the machine took the demands of the consumers for reliability and quality in the many systems and assemblies into consideration. The modernization of large cargo dump trucks along these lines has become the main concern of the plant's collective during the current five-year plan. A testing and design base was incorporated into the enterprise recently for this purpose. The equipment, which has been installed here, helps to adjust the parts and mechanism of the dump trucks scrupulously and on the spot and to bring them to the required condition. The adjustment of the test stands, thanks to which the "running-in" of the machines will be accelerated by at least 10-fold, is coming to an end. During the five-year plan, the collective intends to update all large cargo equipment models and design test models of ultraheavy-weight dump trucks with a cargo carrying capacity of 280 tons. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 49, Dec 86 p 1] 8802

## RAIL SYSTEMS

### BRIEFS

**OMSK METRO PLANNING--Omsk--**Specialists of the Omsk Construction and Engineering Surveying Trust have concluded survey work on the first section of the Omsk Metro ahead of the planned time frame. The results showed that the underground lines will have to be constructed under very difficult hydrogeological conditions. Furthermore, a network of triangulations--a complex of geological points situated on the high buildings of the city--has already been created, which will make it possible to ensure the precise laying of the routings of the new metro. [By V. Malenkov] [Text] [Moscow GUDOK in Russian 22 Nov 86 p 3] 12821

**MINSK METRO EXPANSION--Minsk--**The first test train from Moskovskaya Station to Vostok Station along the new line of the Minsk Metro was driven by engineer-instructor V. Rodnoy and engineer V. Zayets. This section of the underground track was built a year ahead of projected schedule. In a month's time, the metro will become a convenient form of transport for the residents of the nearest microrayon of Minsk. [By D. Sverkunov] [Text] [Moscow GUDOK in Russian 25 Nov 86 p 1] 12821

**KANASH-YUDINO LINE ELECTRIFIED--Kazan, 24 Nov 86--**The first train using electric traction passed along the 115-kilometer Kanash-Yudino section of the Gorkiy Railroad. With the conclusion of work on this section, the length of the electrified railroads in our country reached a "round" number--50,000 kilometers. In honor of this noteworthy event, a memorial was established in Kanash. The first such memorial in honor of the electrification of 25,000 kilometers of the steel mainlines of the USSR was established in Georgia in the 1960s. Work on converting diesel traction to electric is continuing. Today the construction workers of Kaztransstroy [Kazan Transport Construction Trust] are carrying out the electrification of the Kanash-Sergach section. With its start-up, planned for next year, both freight and passenger electric trains will run from Moscow to Sverdlovsk. [By PRAVDA correspondent N. Morozov] [Text] [Moscow PRAVDA in Russian 25 Nov 86 p 3] 12821

**VOLKHOVSTROY-CHEREPOVETS LINE UPGRADED--Volkhovstroy-1--**The first freight and passenger trains passed along the renovated line that links Volkhovstroy with Cherepovets, where the October and Northern railroads meet. Here the transport construction workers, in conjunction with local collectives of track workers, power engineers and communications workers, completed much work on modernizing the almost 150-kilometer section, and now its traffic capacity

will be almost doubled. This is especially important for the fastest possible movement of mining train routings from Kostomushka, which pass through Petrozavodsk to Volkhovstroy and from there take a course to the blast furnaces of Cherepovets. The reconstruction, thanks to which the railroad workers of the October Railroad will be able to accelerate appreciably the transfer of railcars to their neighbors to the north, was carried out in accordance with the comprehensive Intensification-90 program. [By V. Petrov] [Text] [Moscow GUDOK in Russian 9 Dec 86 p 1] 12821

WEST KAZAKHSTAN JUNCTION RECLASSIFIED--Siding No 315 of the West Kazakhstan Railroad on the Kandagach-Makat section has been opened for the receipt and dispatch of freight by carload and small shipments loaded by full carloads only for sidings and non-general-use locations, that is, according to point 3 of the Tariff Guide No 4. It has been assigned the new code of 71550. The Tariff Guide No 4 published in 1985 established code 673806 for it. [Text] [Moscow GUDOK in Russian 24 Nov 86 p 2] 12821

NEW PASSENGER STOPS--The new passenger stops on the Kanash-Cheboksary section (the Tsvil'sk-Shorkino line) have been assigned names: Khornvary (code 26856), for which code 248361 was established in Tariff Guide No 4 published in 1985; Yanorsovo (code 26857) for which code 248374 was established in the Tariff Guide No 4 of 1985. The passenger stops of Khornvary and Yanorsovo have been opened for the pick-up and discharge of passengers for suburban and local train connections, that is, for the indicator "0" of the Tariff Guide No 4. The distances from the Khornvary passenger stop to other stations are: Kanash--67 km [kilometers] and Cheboksary--36 km. The distances from the Yanorsovo passenger stop to other stations are: Kanash--60 km and Cheboksary--43 km. [Text] [Moscow GUDOK in Russian 24 Nov 86 p 2] 12821

SEVEROMUYSK TUNNEL BYPASS UPDATE--The bypass of the 15-km Severomuysk Tunnel is being constructed at an accelerated rate. To avoid the recalcitrant range where passage takes place under severe geological conditions, the construction workers must skirt along the arc and also make three underground corridors, the length of the longest of which is a little less than two kilometers. The third tunnel is the sore spot of the bypass. Work here began in the spring. The tunnel workers have penetrated to 600 meters as of today. [By I. Krasikov] [Text] [Moscow GUDOK in Russian 27 Nov 86 p 1] 12821

12-CAR MOSCOW COMMUTER TRAINS--Moscow, 1 Dec 86--Elongated suburban electric trains have begun to run on the last suburban section of the rail center of the capital, largest in the country. At 8:18 today, the first suburban train with twelve cars, not ten, left the Moscow-Kursk Passenger Station for Petushki in Vladimir Oblast. Much construction work preceded this. Engineer A. Usalev gave a parting whistle, and the train set out smoothly along the track. Some 400 people were its first passengers. "The beginning of the conversion of the most complex Gorkiy route to twelve-car electric trains ahead of schedule," said Moscow Railroad Chief I. Paristyy, "is an important step in solving the transport problems of Moscow and the oblast. We will be able to transport twenty percent more passengers on this route alone after the full conversion of all consists to the 12-car version. This progressive technology will be improved. Preparations for the stable formation of 14-car



electric trains in the near future are intended." [By TASS correspondent A. Dragan] [Text] [Moscow GUDOK in Russian 2 Dec 86 p 1] 12821

MOLDAVIAN AUTOMATED TRAFFIC CONTROL--Kishinev, 4 Dec 86--A new step on the path to creating a unified integrated system for the automated control of shipping has been taken in Moldavia. Real-time information has begun to appear today on the display of the chief dispatcher on the trains passing through Moldavia on the Southwest and Odessa Railroads. The electronic equipment reports on the weight and length of the consists, the type and quantity of railcars, the nature of the freight and the addressees. "Earlier the documents with this information were transferred with the engineer on the train," said Moldavian Railroad Chief Yu. Gerasimov. "Receiving it today a day before the arrival of the trains, we can precisely plan our work, prepare the equipment, correctly deploy the people and inform clients in advance about the arrival of freight or railcars for loading. This allows the workers of related industries to maneuver their equipment more efficiently and organize the work of the loading and unloading teams that have been created at republic enterprises. The idle time of rolling stock is being reduced by almost a third and a large quantity of railcars is being freed up." [By TASS correspondent A. Tanas] [Text] [Moscow GUDOK in Russian 5 Dec 86 p 1] 12821

TU7A DIESEL LOCOMOTIVE APPROVED--Last year the experimental TU7A diesel locomotive, intended for freight and passenger shipping on 750-mm gauge track, left the gates of the Kambarskiy Machine-Building Plant. It was planned and manufactured on the basis of the TU7 diesel locomotive, which has been series produced by the plant since 1971. The new-model locomotive has a capacity of 294 kW [kilowatts] (400 horsepower) and a mass of 24 tons. The reliability of its power plant, hydraulic transmission and underframe have been raised, and the economic and ergonomic indicators have been improved. The TU7A diesel locomotive is equipped with a 1D12-400K diesel and the UGP400/201 hydraulic transmission, which allow it to reach a rated speed of 50 km/hour. Thanks to the efficient dampers of the VNITI [All-Union Scientific Research Diesel Locomotive Institute] system, the locomotive has a good quality ride across the whole range of speeds. The experimental locomotive is additionally equipped with a muffler and spark trap for exhaust gases, a new design for the seals of the axial reduction gears and a device for dehumidifying the pneumatic system. The working conditions of the train crew have been improved. Heat and sound insulation are envisaged for the cab along with chairs adjustable in two planes and a heating and ventilation system, and there is a domestic refrigerator. A clock and radio receiver have been installed on the control panel. The TU7A diesel locomotive underwent testing on the Apsheron Narrow-Gauge Railroad and has been recommended for industrial production. [Text] [Moscow ELEKTRICHESKAYA I TEPLOVOZNAYA TYAGA in Russian No 11, Nov 86 outside back cover] [COPYRIGHT: "Elektricheskaya i teplovoznaya tyaga", "Transport", 1986] 12821

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## MARITIME AND RIVER FLEETS

### SUGGESTIONS FOR IMPROVING MARITIME TRANSPORT MANAGEMENT

Moscow VODNYY TRANSPORT in Russian 25 Nov 86 pp 2-3

[Article by G. Plotko, head researcher of the Institute of World Economics and International Relations of the USSR Academy of Sciences: "Sectorial Economic Science: Problems of Developing Maritime Transport Administration"; Editorial comment follows text of article ]

[Text] Improving the economic mechanism is a multi-plan task, and the administrative system is assigned one of the central roles in it. Everyone agrees that the administrative system must be changed, but there is no unanimous opinion as to how it should be. The main reason here is that the presently existing recommendations on planning the organizational structures and on improving the administrative methods and basic indicators of the functioning (type of product put out by each subdivision, including administrative organs, level of organization, etc.) of maritime transport have no scientific foundation. This is what it leads to.

An analysis of the maritime transport administrative system made at the Institute of World Economics and International Relations of the USSR Academy of Sciences shows that it does not satisfy today's requirements. The main shortcoming is the imperfection of the administrative methods. For example, the planning methods make it impossible to determine the optimum sizes and find the correct proportions in developing the material-technical base of the maritime transport subdivisions. They do not provide for the establishment of identical structures for interacting subdivisions and, which is very important, endowing them with the qualities of stability and controllability.

The search for better organizational structures for administration was implemented mainly by the method of experimentation. The ministry leaders shifted to a new form every time they were convinced that the existing one was no longer effective.

An analysis of the existing principal system of maritime transport administration showed that it has no regional units whose duties would include administration of the basic activity of the fleet and ports of specific basins and that no interaction has been organized between maritime transport and other types of transport in the regions. Hence, it becomes clear that the number of independent

shipping companies in the basins is not dictated by production necessity. As before, the problem of improving administration in the lower unit of the production associations--in the cost accounting operations groups of vessels of the shipping companies--remains incompletely solved.

The system of efficient administration of the basic work, in the theoretical respect, has not been worked out.

The system of recording and evaluating the results of the work of the subdivisions in their basic activity has not been perfected either. This makes it impossible to determine the actual contribution of each subdivision to the overall cause and, consequently, to distribute the income obtained correctly. All of this indicates, in our opinion, that no bases have yet been created to make the transition from formal to actual cost accounting.

The methods used to evaluate the level of organization of production systems are subjective. At most of the maritime transport enterprises, the level of organization is not determined at all. This makes it impossible to evaluate the extent to which production plans at various subdivisions have been stepped up.

Work on automating administrative processes in maritime transport has been in progress for over 20 years already. The results achieved up to now, however, are quite modest, and have no essential effect on the sector's work. The main reason for this is that the work is carried out without preliminary regulation of the organizational structures and administrative methods.

The point is that the organizational structures determine the directions of the information flows in the system, and the methods of administration--its necessary composition; the methods and technical devices of administration taken together determine the administrative processes which will, in principle, be automated. When the organizational structure is incomplete, the directions of the information flows will be inaccurate. When the administrative methods are incomplete, it is impossible to correctly substantiate the required composition of the information for each level of the administrative organs, and it becomes difficult to determine the administrative processes applicable for automation.

This is now happening in practice in operations for the Morflot ASU [automated control system]. After all, complete information is necessary to solve any operations-economic problem and to make decisions. How does one determine what information may be considered complete, let us say, for the ministry, for the chief of administration, for the chief of division of a shipping company or port, etc.?

The ASU creators are taking this route--they "photograph" the existing information flows for each administrative function, from bottom to top and from top to bottom, and, after classifying and encoding, i.e., translation into the machine's language, they store all of this in its memory. A person wishing to use the information system services should himself choose the information that he needs. Not a simple task....

With this approach, the information volume will be very large. Here, it is worth thinking about whether to continue enlarging the capacities of the electronic computer, increasing the channel capacity and creating infinite stores of information, or to try to substantiate scientifically the necessary flows of information and its composition for each level in the hierarchy of the maritime transport administration. The second direction is undoubtedly preferable.

At present, the transport centers are the "bottleneck" in the country's transport system. It is here that the main idletimes for means of transport and cargo delays occur. At a number of maritime ports, the enterprises included in the transport centers have been converted to working according to inter-coordinated continuous schedule-plans. These measures to a certain extent contribute to better operations of interacting types of transport, but they do not completely solve the problem existing here. The point is, that the problem of organizing the interaction of different types of transport cannot be solved within the boundaries of individual transport centers. This is a general transport problem, calling for a search for coordinated solutions, not only in the development of a material-technical base for each type of transport and technology for shipments, but also in administrative methods for the work of all the subdivisions taking part in the transport process.

The research carried out showed that the sector's transition to new management methods must not be implemented gradually, according to its readiness. It must be done simultaneously throughout the entire complex of sectors that have technological communications. The interacting sectors (enterprises and even the subdivisions of enterprises) should have identical structures for the administrative organs and, in addition, intersectorial administrative organs should be obligatory at the points of interaction.

As applied to transport, this means that the country's transport system should have intersectorial transport organs (central, regional and junction) and administrative organs for individual types of transport. The basic task of the intersectorial transport organs is to coordinate the work of all types of transport, to follow a unified technical policy and to work out long-range plans for the development of the country's transport system.

The basic maritime transport administrative system should be constructed in a manner other than the existing one. It should consist of the central organ (in Moscow), regional navigation associations (at the basins) and administrative organs for specialized navigation enterprises (at the basins).

Methods of solving administrative problems should constitute the basis of the administrative system. This means that the desired results in the work of the economic system must not be achieved by the mere transition to a new structure of administration alone. There must be a simultaneous change in the methods of administration as well.

With a transition to new administrative methods, the organizational structure must be put in order. The directors of the shipping companies are now being granted the right to change the structure of the administrative organs themselves, with the consent of the ministry. It is not difficult to imagine



what might happen if each economic director began to improve the organizational structure as he saw fit. The confusion would be greater than it is now.

The system of administration (subject of administration) is derived from the material-technical base (object of administration). Consequently, one must not engage in improving the administrative system in maritime transport without regard for the connection with its material-technical base, with the technology of cargo-shipping and materials handling operations, etc. Moreover, the solution to this problem must start from establishing order in the material-technical base. There is no other way.

For this, however, the practical workers must be supplied with substantiated methodological recommendations on establishing the structures of the material-technical base of the subdivisions taking part in the transport process, and corresponding with the aims and criteria determined for maritime transport operations in specific directions. They must also be supplied with scientifically substantiated methodological recommendations for planning the organizational structures of administration.

The need to improve cost accounting was pointed out even earlier in various official documents. The maritime transport enterprises, however, did not convert to full cost accounting, not because their directors did not understand all its merits, but because they did not know how to do it correctly. Unfortunately, sectorial science has not armed them with this knowledge even now, on the eve of converting to new methods of economic operations.

Really, for this decisive step, each subdivision must determine its own concern, production and the measure of it, and moreover in units in kind. Right now, many maritime transport subdivisions, including the administrative organs, have no products list nor its measure in kind. In addition, an objective system of recording and evaluating the results of the work of all those taking part in the transport process must be worked out. There is no such system now.

In the existing situation, when the sectorial science has not yet produced reliable recommendations, the economic and party directors of maritime transport at all levels were left with only one method of improving the administrative system--experimentation. They have used it up to the present time. It would seem that this method must not be relied upon further. There are many very interesting and valuable initiatives from advanced production collectives. The proposals from experienced economic and party leaders are not receiving the proper execution and distribution merely because the search for specific solutions to improving the administrative system cannot be crowned with success until an overall solution to this problem is found which will make it possible to reorganize the maritime transport administrative system as needed and correctly. These, in short are the realities of sectorial economic science. Can they serve as a support in solving the problems of shifting the sector onto an intensive path of development? There can be no unequivocal answer.

What is the cause of this condition? The basic cause lies in the fact that, so far, the search for ways to improve the maritime transport administrative

system has been carried out by using different types of mathematical methods. These methods are able to describe only the quantitative aspect of the processes taking place in the system for which the laws of a change in the conditions for their occurrence in time are known in advance.

Maritime transport, though, is an economic system in which the processes that take place are characterized not only by quantitative but also by qualitative changes. Consequently, the functioning of this system cannot be correctly studied and described by quantitative methods alone. To do this there must be a method which makes it possible to take into account the relationship between the quantitative and qualitative changes in the system, i.e., a system-structural method is necessary. The use of this method does not exclude the use of mathematical methods, but on the contrary, makes it possible to find their true place in solving the problem of improving maritime transport administration.

Also contributing to the stagnant phenomena in sectorial science was the disregard of research on the administrative problem that was carried out from scientific standpoints different from those held by scientists of the sector's administrative system.

Folk wisdom says: In order to choose the road ahead correctly, one must first of all glance back. We have glanced back at the state of economic science. What, then, must we do next? If the sector's transition to new methods of economic operations has already been announced, and there is nowhere, as they say, to retreat, sectorial science must be obliged, urgently, in two or three years, to find a solution to the problem of improving the administrative system.

This task, however, must be presented to it not in general form, as it was before--improving the sectorial administrative system on the basis (or within the framework) of the Morflot ASU--but specifically and as follows:

1. Develop basic concepts in the science of administration and give a content-substance classification of administrative functions. (At present our special literature contains no unified concepts of the science of administration, nor unified classification of the functions of administration.)
2. Reveal, as an example of maritime transport, the mechanism of interaction between object and subject of administration in the economic system and develop a research methodology corresponding to the nature of the object being studied. (In special literature, the mechanism of this interaction is not revealed, and no methodology for studying the administrative system has been worked out.)
3. Study the basic activity of maritime transport, using the methodology worked out, and determine ways to improve the administrative system for this activity at the present stage.

This task must be presented to two or three scientific collectives. An identical period for fulfilling the research will be established for all. This will be a true competition in science. The scientific collective whose solution to the problem is recognized as correct should head the scientific-methodological

leadership of the research on the problem of administration for the other types of activity at all the institutes in the sector. The disadvantage in this, that several scientific collectives will be engaged in solving the same problem from different theoretical standpoints, will be immeasurably less than that presently suffered by the sector, when all of its institutes are engaged in improving administration within the framework of the sectorial ASU, from the same, but inaccurate scientific standpoints.

The period of two to three years was determined because, by this time the economic leaders of the subdivisions of the Ministry of the Maritime Fleet, having converted to the new methods of economic operation, will be convinced from personal experience of the need for scientific support in solving the problem of intensifying the development of maritime transport and will accept the scientific recommendation as long-awaited.

As a rule, new people are needed to solve new problems. Understanding this, the party has considerably updated not only the central, but also the territorial organs. Experienced, innovative specialists have also been advanced to supervisory economic posts. But in sectorial economic science everything so far remains unchanged, even though it is simpler to evaluate the work of a scientist over a long period than that of an economic supervisor.

Properly, practical experience itself gave the evaluation of the work of the economic scientists who engaged in improving the administrative system--they proved to be unready to issue recommendations on converting the sector to new forms and methods of administration. If one takes into consideration at the same time the fact that for scientific personnel, a change in thinking is a very painful process, and not everyone is able to revise his scientific views, which he has held for two or three decades, the need for updating here becomes totally urgent.

The organization of sectorial science itself is now such that it is impossible to find an official who would be interested in seeking new ideas, in considering them and in putting the achievements of scientific-technical progress into practice not in words, but in deeds, and who would answer for the state of science not only morally but also materially. The immutability of the situation in sectorial science makes it impossible to change the forms of exchange of opinions among scientists and as a result does not contribute to accelerating the introduction of the achievements of scientific-technical progress into practical work.

Without a reliable scientific guarantee of practical measures to improve the economic mechanism, maritime transport cannot be shifted to an intensive path of development. This means that solving the existing problem must begin with a reorganization of sectorial economic science.

#### Editorial Comment

In publishing this article, the editors hope that the sectorial science personnel will express their opinion on the essence of the problems raised.

12151

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## MARITIME AND RIVER FLEETS

### LIGHTER SYSTEM FOR OB-IRTYSH BASIN PROPOSED

Moscow VODNYI TRANSPORT in Russian 22 Nov 86 p 1

[Article by A. Sereda, division chief of the Ob-Irtysh United Shipping Company: "LASH Ship Systems for Small Rivers"]

[Text] Specialists from the Central Technical-Design Bureau of the RSFSR Ministry of the River Fleet and the Leningrad Institute of Water Transport have begun research on developing river LASH ships for the Ob-Irtysh basin. This work was started in accordance with the decision of the USSR State Committee for Science and Technology to create, in the 12th Five-Year Plan, promising, highly economical technical devices for development of transport on the small rivers of the Ob-Irtysh basin in the regions of the Western Siberian oil and gas complex.

The technical council of the Ob-Irtysh United Shipping Company, with the participation of representatives of the Central Technical-Design Bureau of the Ministry of the River Fleet and the Leningrad Institute of Water Transport, reviewed the information on creating a LASH ship system in the Ob-Irtysh basin.

In accordance with the decision adopted, two types of planning proposals for development of the LASH ships will be drawn up: for work on the mainline rivers--the Ob and the Irtysh--and for work under maritime navigation conditions--the Ob-Taz Gulf. Each LASH ship will transport 4-6 loaded barge-lighters, with a cargo-carrying capacity of about 200 tons, from Omsk, Tobolsk and Surgut to the mouths of small rivers where, after being lowered into the water, the lighters, towed by shallow-draft pusher tugs, will be delivered to the consignees at points along the small rivers.

Preliminary calculations indicate that, under the conditions of the Ob-Irtysh basin, the LASH ship system has advantages over the existing system of delivering cargoes to the small rivers of the Tyumen North, considerably shortening the delivery times, raising the degree of cargo preservation and eliminating their unnecessary transshipment.

Accelerating the development and formation of a LASH ship system will unquestionably contribute to fully satisfying the demands of the enterprises of the Western Siberian oil and gas complex for cargo shipment by river transport.

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## MARITIME AND RIVER FLEETS

### BRIEFS

**BIYA RIVER DREDGING PLANNED**--V. Filkov, chief of the Main Administration of Waterways and Hydraulic Engineering of the RSFSR Ministry of the River Fleet, reported to the editors that the article titled "Along the Fairways by Log" published in VODNYI TRANSPORT No 100 of 21 Aug 86 has been reviewed by the administration. The Biya River, along its whole length with the exception of a 30-kilometer section, is characterized by considerable longitudinal inclines up to 40 centimeters per kilometer of route, high current speeds, rocky shoals and rapids, steep ledges and large rocks. Furthermore, timber stream driving is carried out along the Biya River to the Biysk River, which also makes navigation substantially more difficult. In order to maintain navigable depths on this river, the conducting of an extremely large volume of expensive dredging operations is required. The West Siberian River Shipping Company and the Ob Basin Administration in June of this year considered the question of ensuring stable depths and determined a list of equipment essential for the removal of rock formations, the cost of which is about a million rubles. The time for executing these operations is no less than 4-5 years. Taking into account the fact that the deepening of rocky rapids with large inclines may not have the anticipated effect, ministry management has decided to implement passenger transport on the Biya River under natural conditions, without the employment of additional operations. [Text] [Moscow VODNYI TRANSPORT in Russian 27 Nov 86 p 3] 12821

**NORTHERN RIVER FLEET UPGRADED**--Arkhangelsk--The river workers of the Northern River Shipping Company have this year carried out foreign shipping for the first time. The steamship Volgo-Balt 246 left for the Bulgarian port of Varna with a load of timber. The access to international routes dictates a different strategy for the river workers for replenishing the fleet. The shipping company has begun to receive the balance of its vessels from Czechoslovak shipyards. The Amur steamship will be the first to enter service. It is smaller than the Volgo-Balt in cargo capacity, but has a more convenient hold design which permits the transloading of the most varied of products. [By A. Chashchin] [Text] [Moscow VODNYI TRANSPORT in Russian 9 Dec 86 p 1] 12821

**MODERN RO-RO VLADIMIR VASLYAYEV**--Nikolayev--The year's ship turnover program is being successfully completed at the Black Sea Shipyard. The high-speed Vladimir Vaslyayev gas-turbine ship has been launched here. The new vessel can reach a speed of 25 knots with an impressive displacement of 35,000 tons.

It continues the series of bulk-cargo vessels of the Atlantika type with horizontal handling methods that have acquitted themselves well. This reduces idle time in ports by four-five times: motor vehicles, tractors and other vehicles can drive under their own power into the open sides of the ship, while pallets and containers are loaded by automatic loaders that the vessel is equipped with. On-board computers make it possible to automate the operating mode of the economical gas-turbine installation, assist in the selection of optimal speed and suggest the most efficient disposition of cargo on all four decks. At the service of the crew are single cabins, a gym and other comforts. The shipbuilders employed a progressive organization of labor in building the gas-turbine ship. Integrated teams here worked for the end result, which was here deemed to be the turnover of a specific section of the vessel. [By A. Kuznetsov] [Text] [Kiev PRAVDA UKRAINY in Russian 7 Dec 86 p 2] 12821

NEW MINISTER ON FLEET ACCIDENTS--Minmorflot [Ministry of the Maritime Fleet] has reviewed the editorial article that was published in the newspaper entitled "Battle against Accidents!" and feels that it has raised a most important issue in a timely fashion. Unfortunately, the situation with regard to the accident rate in the fleet is quite bad. It has worsened appreciably with regard to the sinking of the Admiral Nakhimov. The results of investigation have revealed serious shortcomings in the operations of the Black Sea Shipping Company and the Minmorflot apparatus. A number of them were correctly noted in the article. In light of the CPSU Central Committee decree with regard to the Admiral Nakhimov accident, Minmorflot has undertaken steps for the radical improvement of navigational safety. This question was reviewed in detail at an expanded session of the collegium with the participation of representatives of the shipping companies and ports that was held in October of this year. According to the results of the discussion, ways of improving the state of affairs with regard to navigational safety were determined. Meetings of the party and operational active memberships are currently being held at the shipping companies, and steps are being taken to change work styles and methods. The Minmorflot Collegium hopes that the editors of the newspaper VODNYI TRANSPORT will conduct a principled discussion on issues of navigational safety in the future as well and in this way make their contribution to the resolution of tasks for the fundamental improvement of the operational quality of maritime transport. [By USSR Minister of the Maritime Fleet Yu. Volmer] [Text] [Moscow VODNYI TRANSPORT in Russian 9 Dec 86 p 2] 12821

ICEBREAKER-FERRY KIRGELAYD LAUNCHED--(TASS), Riga--The production of a shallow-draft icebreaker-ferry has been mastered by the collective of the Riga Shipyard. The maritime all-conditions vessel Kirgelayd has been launched. It will ply the waters between the small islands of the Moonzundskiy Archipelago and the continental portion of Estonia. The shipbuilders are beginning the procurement of parts for the next vessel. Shipbuilding is a new industrial sector for Latvia which was developed in the last five-year plan. Ferries with Riga markings are operating on the maritime crossings of the Far East, the Black Sea and the Baltic. Each such vessel can take on up to 130 passengers and dozens of automobiles. In laying down the next versions of the all-conditions vessels for the Baltic on the stocks, the Riga workers took into account the observations and suggestions of the operational workers. The

vessel draft was considerably lessened, which will allow it to call at small island harbors. Three diesels have been installed on the new ferries whose capacity is 900 horsepower each. The vessels are maneuverable and can carry out trips year round under difficult ice conditions. [Text] [Moscow VODNYI TRANSPORT in Russian 11 Dec 86 p 1] 12821

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## PORTS, TRANSSHIPMENT CENTERS

### PORT CHIEF ON NEW TALLINN GRAIN COMPLEX OPERATIONS

Moscow VODNYI TRANSPORT in Russian 9 Dec 86 p 2

[Interview with Novotallinskiy Port Chief Anatoliy Nikolayevich Kanayev by D. Zheleznyakov, Tallinn: "The Grain Complex: Reconnaissance in Force"; first paragraph is source introduction]

[Text] As was recently reported, the first grain recently went into the grain elevators of the grain complex at the Novotallinskiy Port. Our interlocutor is port Chief A. Kanayev.

[Question] Anatoliy Nikolayevich, first of all I would like you to clarify the following issue: the Vremya TV program reported that the grain complex was placed in service ahead of schedule. Was that so?

[Answer] Not quite. The fact is that grain for the elevator has arrived, but that does not mean that the state commission has accepted the complex. This is testing that is reconnaissance in force, so to speak.

This year, in the planned time period (so that you don't write "ahead of schedule"), we will turn over the grain complex with a capacity of five million tons a year. It includes a pier 330 meters long that can handle vessels with a cargo capacity of up to 100,000 tons, a berth 280 meters long for vessels with half the cargo capacity, a 300,000-ton elevator and a railcar loading station. There are also a social and cultural welfare building, a computer center for controlling the complex robot, a production and technical laboratory and a loading complex for perishable cargo--meats, fruits etc. It has three berths, two warehouses that can store about five thousand tons of perishable cargo, and freezers. There is also a workshop, a garage for port transport, a social welfare complex with its own cafeteria, a computer center and so on.

Furthermore, it is necessary to place in operation a number of facilities of an auxiliary nature that ensure the normal operation of the port, including railroad tracks with automated signals.

The start-up and fine-tuning work on the grain-handling complex began on October 20. At first all mechanisms were run idle, and then the steamship Maksim Litvinov was brought to the berth and the first 6,700 tons of grain



were sent to the elevator. The second "scout" vessel was the Sergey Lemeshev on October 27. Some 22,800 tons of grain were offloaded. And it is still necessary to pass no less than 30,000 tons of grain through for testing. The fifty-thousand-ton vessel Khariton Greku is expected.

After the completion of the adjustment of the mechanisms and equipment, the facilities will be presented to the commissions--both the workers' and the state commissions. This is projected for sometime in the 20s of December.

[Question] What is the collective of the Novotallinskiy Port now occupied with?

[Answer] We are basically learning and training specialists for work on equipment that has no existing analogues in the country. Furthermore, we are assisting the construction workers in carrying out the start-up and fine-tuning work and the preparations for operation. After all, we will have to fulfill the state plan beginning on 1 Jan 87, and it is quite intensive for next year--3,350,000 tons. This quantity of cargo must be handled during the period of guaranteed operation, before moving to planned capacity.

[Question] And how are things with the planned time frames--everything in order?

[Answer] There is unfortunately some concern. Basically on the facilities on which Soviet construction workers are employed (the port is being built by foreign firms in conjunction with our own hydraulic construction workers). In particular, the construction of several berths and the laying of motor-vehicle roadways are lagging behind schedule. We should have serious complaints with regard to quality at a number of facilities as well. There are only a certain number of days left before start-up, and the general contractor and his subcontractors must get themselves going.

[Question] It is not far to the new year. Let's assume the port has begun functioning. What problems and difficulties can be foreseen today?

[Answer] Who is occupied in guessing when there are quite acute problems before us today? We have more than enough of them...

Let's take the construction of the protective structures, that is, the pier that protects the berthed vessels from bad weather. The planners of Lenmorniiprojekt [Leningrad Maritime Scientific Research and Planning institute] calculated that the inclusion of protective structures in the first phase was economically inexpedient. They reasoned thus: the cost of the protective structures is 110-120 million rubles, while losses will total roughly a million a year, that is, less than one percent. But that arithmetic is not suitable today, it is, I would say, from the investment policies of past years. After all, the money is invested in structures that will stand forever, while the losses are irretrievable... We have already lost a lot: we had to wash down the extensive territory anew after a storm, the pile-driver was smashed and swamped, and a number of small craft were damaged. And the movement of hundred-thousand-ton vessels into the roads without full holds

(grain is, after all, a free-flowing cargo!) in stormy weather is not completely safe...

A second problem: the social and cultural facilities are lagging. We will get the kindergarten only at the end of next year, while it is needed today. We are giving over two floors of a dormitory for the kindergarten, but this is not the way out. The school will only enter service next year, and that is even only the first phase. The social and cultural infrastructure is lagging behind the start-up of productive capacity.

The transportation question is in the resolution stage. Route 13 from Maardu to the port entrance has been opened. The bus route Tallinn--Maardu--Novotallinskiy Port will soon be in operation, and moreover the bus will pass by the new microrayon of Lasnamyae.

[Question] And how are things with housing?

[Answer] Some 25,000 square meters of housing will be turned over this year, and 24,000 are projected for next year. Related-industry workers will receive housing here along with the port workers. All housing is being built in the city of Maardu, and this is very convenient for our employees.

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## PORTS, TRANSSHIPMENT CENTERS

### BRIEFS

NEW KIRENSK PORT BERTH--Kirensk--A second start-up complex of the Melnichnyy berth was recently placed in operation at the Port of Kirensk on the Lena. The new berth will permit a substantial increase in the traffic capacity of the port. The creation of a cargo district based on this berth has been proposed for the future. The development of the berth front, production spaces and living accommodations is continuing. [By a VODNYI TRANSPORT correspondent] [Text] [Moscow VODNYI TRANSPORT in Russian 18 Nov 86 p 2] 12821

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